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GENERALIZED COMPUTER PROGRAM

# HEC-3
# RESERVOIR SYSTEM ANALYSIS FOR CONSERVATION

PROGRAMMERS MANUAL

JANUARY 1976

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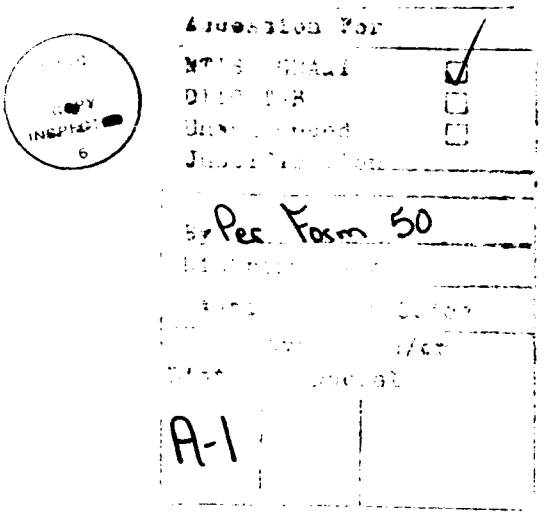
COMPUTER PROGRAM 723-X6-L2030

# HEC-3 RESERVOIR SYSTEM ANALYSIS FOR CONSERVATION



PROGRAMMERS MANUAL

JANUARY 1976

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# FOREWORD

This manual is intended for the user who wishes to become informed of the internal structure of the computer program and for the programmer who is concerned with making modifications to the program. It supplements the Users Manual dated July 1974, which contains a technical description of the program and instructions for its use.

# RESERVOIR SYSTEM ANALYSIS FOR CONSERVATION

## PROGRAMMERS MANUAL

## TABLE OF CONTENTS

# RESERVOIR SYSTEM ANALYSIS FOR CONSERVATION
# PROGRAMMERS MANUAL

## INTRODUCTION

### 1. ORIGIN OF PROGRAM

This program was originally developed in The Hydrologic Engineering Center by Leo R. Beard and has been augmented and restructured during the past several years in connection with its use in many water resource studies throughout the United States. The current version of the program has a new structure of input data and operation control.

### 2. PURPOSE OF PROGRAM

This program performs a multipurpose routing of flows in a reservoir system for up to twelve periods of uniform or varying length per year based on varying flow requirements at reservoirs, diversions and downstream control points. Power peaking and energy requirements at reservoirs can be accommodated. The program can accept any nonlooping configuration of reservoirs, diversions, power plants and requirements, but does not provide for channel routings (i.e., attenuation of flows in river channels) or percolation losses. It can assign economic values to all outputs and summarize and allocate these in various ways. It can automatically iterate to optimize yield at a specified location. The flexibility of input and output requirements and of computation techniques enable the program to solve relatively simple problems with minimum effort or elaborate complex problems with a relatively high degree of accuracy.

The program is intended for use on a variety of computer systems, and for this reason, coding is in FORTRAN IV and adheres as much as possible to operations that are common to FORTRAN software available to practically all large computers.

### 3. NOTIFICATION OF PROGRAM MODIFICATIONS

A user or programmer who finds a mistake or desirable modification in this program, or who has difficulty using the program, is requested to notify The Hydrologic Engineering Center. Also, the Center would appreciate receiving notification of changes required to run the program on specific computer configurations.

### 4. ORGANIZATION OF THE PACKAGE

A general overview of the organization of the package can be obtained from the logic flow chart of figure 1. The package consists of the main

program and six subroutines. The first subroutine, COMP, could have been included as part of the main program except for the need to segment for overlay use in some computers or to reduce the requirements for symbol table capacity. Dimensions are specified in the COMMON statements, except for those peculiar to each segment, which are contained in separate DIMENSION statements. A detailed description of the calculations being performed in each segment is contained in the following chapters. Section letters referred to are shown on comment cards in the program listing in column 4 immediately preceded and followed by equal signs.

# DESCRIPTION OF PROGRAM

## 5. MAIN PROGRAM DESCRIPTION

The main program initializes many of the variables and performs most of the printout. Use is made of subroutine INOUT to assign default values to variables that are not read and to data on tape 2 for retrieval by the main program. Subroutine COMP is used to perform system computations for each year. BLOCK DATA is used to initialize variables to constants and alphanumeric information at compilation time. Other subroutines are used for special purposes as described in their respective chapters.

SECTION A: Values of zero for ITRNS and 1 for IPNT are set as standard transfer and print controls that might be overridden later. All tapes are rewound for initial use. Then many variables that summarize output for the entire job are initialized. If ITRNS is 1, the yield optimization routine has caused a transfer back to initialize variables again. A transfer is then made to bypass all system read statements. If ITRNS is zero, this is a normal operation, and system variables are initiated in preparation for reading system data.

SECTION B: Subroutine INOUT is called to read cards and to write on scratch files (tapes 2 and 4). IYR1 is set at the starting year identification number for printout use. IYEAR is set the same for use in subroutine OUTPT. Specified values of efficiency are stored in the EFY array for each plant in case they are not to be interpolated from table values. The number of iterations per computation interval (NCYCL) is set to 2. If evaporation is not read each year, the pattern evaporation is read and printed here, and if it totals zero, NCYCL is set to 1, because an accurate computation can be made in one pass (except for power). If there are power plants in the system, two iterations per interval are needed, and, if there is to be a power system computation, NCYCL is set to 3, because power is allocated after the first cycle and it takes two more cycles to complete accurate evaporation and power computations. If system power is to be computed, system power requirements are read and printed. If this is a yield optimization computation, a new page is started on the printer.

SECTION C: For yield optimization, CFLOW is used as the yield multiplier and is initialized to 1.0. Tape 2 is rewound. For yield optimization, maximum shortage or minimum surplus, as ratios of requirements at station IFLOW, will be determined; these quantities are set to zero and .5 respectively in order to initiate the search. TFLOW is set to -1 to show that a critical period has not yet started. The initial storage at each reservoir is then entered as the storage at the start of the first period and end of preceding period. The long computation loop for

a year is then started. Runoff quantities are read from tape, as are all other quantities that vary from year to year. Then, if yield optimization is desired (IFLOW positive), the required flow for station IFLOW is retrieved from the temporary array used in Section F and multiplied by the coefficient successively, approximated in previous iterations.

SECTION D: Local inflows at each control point (runoff below upstream reservoirs) are next computed from runoff station data and converted to flow units used in later computations. If JUPQI is positive, local flow is computed as the sum of flows that have been read in for every intermediate area between control points and below upstream reservoirs. If any of these are negative, they are set to zero and a message is printed. A check is made that minimum desired flows are at least as large as minimum required flows, which in turn must be at least as large as leakage. Then desired flows are stored in the QMINS array, which is the target flow after any shortage declaration made in subroutine COMP.

SECTION E: Sums of flows for the year are initialized to zero to start accumulations. Those that will be used to compute shortage indexes are initialized to .001 to avoid dividing by zero in that computation. Peak power for year (SYPMX) is set high in order to search later for the lowest value for the year. The titles for the year or group are printed, and the computation subroutine is called.

SECTION F: For the yield optimization routine, total end-of-period storage and total storages at top and bottom of the conservation pool are obtained for all reservoirs actively serving the yield location (control point IFLOW). If the conservation pool is full, shortage is set to zero and a new accumulation of total requirement since full reservoir is set to zero. If the conservation space has not yet filled (TFLOW = -1), no computations are made. If the conservation space has filled but is not now full, minimum desired flows are accumulated and any shortages are also accumulated. The minimum remaining conservation pool is recorded for use in determining how much the yield can be increased in the event that no shortages occur. The minimum ratio of surplus to accumulated yield since reservoirs were last full, and the maximum ratio of shortage to accumulated yield are stored for later use. Some constants are then established for computing average flows to date and a printout DO-loop is started. This DO-loop is bypassed if printout is temporarily being suppressed (IPRT negative). A print indicator (JPRNT) is computed for each control point to suppress printout if desired either for all control points or for the specific control point. Then pertinent quantities are stored on tape 3 for use in the subroutine ECON. In order to allocate economic benefits to upstream reservoirs, the difference between inflow and outflow at each reservoir for the interval is computed and the sum for all upstream reservoirs calculated. Then those reservoirs having a negative difference if the sum is positive or a positive difference if the sum is negative are removed from the sum, and the difference is set to zero. This avoids assigning negative contributions to any benefit

or loss. The contribution ratio for each reservoir is stored in the QII array. If the sum is negative, all upstream reservoirs are given equal weight in benefits allocation and QII is the reciprocal of the number of reservoirs. The values of QII and the total difference of inflow and outflow at upstream reservoirs is written on tape 3. Other quantities to be saved on tape 3 depend on the type of benefit. If the benefit is a function of flow at the control point, both preproject and regulated flows must be saved in order to establish benefits. If the benefit depends on storage, power generation or diversion, only the quantity concerned is saved, since it is assumed that these items would not exist without the project.

SECTION G: If output units other than standard are specified, all output quantities involved are converted in this section. The constant CCFS converts from cfs or $m^3$/sec to desired flow units and CACFT converts from acre-feet or thousand cubic meters to the desired volume unit.

SECTION H: Average flows to date are computed by multiplying the average-to-date for the preceding year by the number of preceding years, adding this year's value and then dividing by the total years to date. Squares of annual flow shortage ratios are accumulated for later computation of shortage indexes.

SECTION I: Control-point data relating to inflows and diversions are printed in this section. Headings with pertinent information on system configuration are first printed. The sum of squares of annual diversion shortage ratios is accumulated for later computation of the diversion shortage index.

SECTION J: Reservoir and power data are printed in this section. Average annual evaporation and power quantities to date are computed. The sum of squares of annual power shortages is accumulated for later computation of the power shortage indexes. Then power quantities are converted to kilowatts from thousand kilowatt-hours if that print option is specified. The minimum peaking power capability for the year is established for printing with monthly peaking capability if this print option is specified. An operation control indicator for each month is printed for analysis of the operation study.

SECTION K: At the start of this section, control point data relative to outflows are printed. Then complete arrays as specified are written on tapes 1 and 4 for rearranging later. The year count is incremented and system power summary is printed. The sum of squares of annual system power shortages is accumulated for later computation of the system power shortage index. The year DO-loop is ended.

SECTION L: Adjustment for the yield optimization routine is accomplished here. If TFLOW is -1, the reservoirs have not filled in the entire operation, and a shortage ratio of .3 is arbitrarily set in order to force a downward adjustment of the target yield for the next trial. If a shortage ratio greater than .01 occurred, it is constrained to a maximum of .3, and the coefficient CLFOW by which the first estimate of yield is to be multiplied for each successive trial is multiplied by 1 minus this shortage ratio. If the resulting value of CFLOW exceeds 1, a reversal in the direction of adjustment occurred, and the adjustment is reduced by one half to inhibit continuous reversals due to over-adjustments. If the reservoirs have filled and no shortage occurred and if the surplus ratio is greater than .01, it is constrained to a maximum of .15, and CFLOW is multiplied by 1 plus this surplus ratio. If the resulting value of CFLOW is less than 1, the adjustment is reduced by half. If either the shortage ratio or surplus ratio is less than .01, optimum yield has been approximated, and the indicator IPNT is set to 1 in order to call for one more complete computation with printout and for subsequent termination of the job. The value of ITRNS is set to 1 to call for another trial, and adjustment values are printed. The year counter is set to the initial value for the next trial. Note that this entire yield computation is bypassed if IPNT exceeds zero, as it would on the last trial. If the yield adjustment computation is not bypassed, a new trial is started immediately following the adjustment. Otherwise, long-term average flow, evaporation and power values are printed. If the update routine is called for, this means that only a part of the operation period has been computed, and the program branches back to read new system data for continuing the operation study.

SECTION M: Except for short-interval computations, the shortage indexes are printed next. They are computed by multiplying the sum of squares of annual shortage ratios by 100 and dividing by the number of years of operation. If requirement is zero, the shortage index is set to -1. Temporary variables for flow shortage indexes are used in order to subscript them in the order that they are to be printed out instead of by control point number.

SECTION N: Storage frequency data are printed. This is percentage of the conservation space occupied. When desired, subroutines ECON and/or REARNG is called. A branch back is then made for the next job or termination of the run.

## 6. BLOCK DATA DESCRIPTION

Constants and alphanumeric information are stored at compilation time by DATA statements. Values equaling the dimension limits are stored for testing against subscripts and also for initializing arrays. Input card identification codes are stored and later used to determine

the sequence of cards read. FORMAT specifications used in subroutine OUTPT are stored in arrays. A check of the DIMENSION limits should be made to insure that the array is large enough to accommodate the FORMAT. The carriage control character "+" which causes the printer to print two or more records on one line may differ on some systems. These changes are noted on the program listing.

7. SUBROUTINE INOUT DESCRIPTION

The input structure of this program was designed so that cards or values may be omitted and commonly used values assigned as default values to the variables. Values that were either read or assigned are printed.

SECTION A: Default values are assigned here to variables not required as input. These are overridden when values are read from cards.

SECTION B: Title cards are read from cards if they are from the first job. Otherwise they are read from tape 2, written at the end of the previous job. If there are no jobs following, an "end-of-file" is detected and the run is terminated. Job specification cards are read and written alphanumerically to a scratch file (tape 4). The identification codes are tested to determine the sequence of the cards. The file is then rewound and the card images read again under their respective variable names and format. Contingency variables are set to 1.0 if they were not specified in the job data. Standard conversion limits and unit names are defined if other desired quantities were not specified.

SECTION C: Printout of the job specification data is done before reading the control-point sequence. A conversion constant is set to convert average flows to volume units per day. Interval identification numbers and the total number of days per year are computed. The constants for converting input inflows and demand units to those needed in the program are established. If specified constants are negative, this means that flows are to be in volume units, and a conversion to average flow rates is made.

SECTION D: Start reading control-point sequence data. Here, again, the same procedure of reading from cards, identifying and writing to a scratch unit is done. Since quantities will later be subscripted using the control point identification number as a subscript, these are tested for dimension size, and the job is aborted if the dimensions are exceeded. Control points are counted. Specification and operation data for this control point are printed.

SECTION E: If a reservoir exists at this control point, the identification number is tested against the reservoir dimension limit, and the numbers and identification of reservoirs in the system and of reservoirs

at and above this control point are computed. If there is a control point downstream and there is no reservoir here, this and all unregulated control points directly upstream are identified as part of the uncontrolled area above that downstream control point. If there is a control point downstream and a reservoir at this control point, this reservoir is identified as a reservoir directly above that downstream control point. Reservoirs at and above this control point are next identified as reservoirs at or above the downstream control point also. If there is not a reservoir at this control point, all reservoirs directly above this control point are identified as reservoirs also directly above the downstream control point (that is, there are no intermediate reservoirs). If there is a diversion at this control point, the total number of diversions in the system is incremented and tested against the dimension limit. Diversion quantities are subscripted with the sequence number in which the diversions are identified. Cross-identification with the control point number is established. The number of diversions at or above this control point is incremented, and the diversion control-point number is identified as one of them.

SECTION F: If the second quantity of the required diversion read on the DV card is negative, it signifies that this diversion is actually a return flow, with the first quantity identifying the diversion where the water comes from and the second quantity the ratio of the diverted flow that returns. These are printed. If the second quantity is not negative, this is a normal diversion, and remaining diversion demands are printed. These demands are multiplied by the conversion factor read earlier (Section C). These are put in the QDIVS array, which will represent flow requirements after any shortage is declared. Diversions at and above this control point are identified as diversions at and above the downstream control point if one exists and if no reservoir exists at this control point.

SECTION G: Maximum and minimum required and desired constant flows are subscripted by control point and month in the event that seasonally varying quantities are not read in subsequently. If specified, quantities for each of these variables are read in as seasonally varying quantities. All such quantities are then converted to units needed in the program. If yield at this control point is to be optimized (IFLOW positive), the variable QMIN is stored also as TMPR for modification in each successive iteration of the optimization routine.

SECTION H: Reservoir operation data are printed. The reservoir elevation for the last period at this location is defined as zero so that there will not be an undefined quantity if this is a tailwater reservoir for another power plant. Zero should be a low enough elevation to cause the downstream reservoir not to control during the first computation period. If a negative quantity is read as a temporary variable for

initial storage, storage is that already in memory, and this must be an update operation. Storages for each level are read and printed. If there is no seasonal change, only one value for each level need be read, and a routine fills in the remaining values. Table values of storage, elevation, area and outlet capacity are next read and printed. Power plant data are next read and printed, using the subscript IP as the sequence number of the power plant.

SECTION I: If tailwater elevation was read as zero or blank, a table of flow vs. tailwater elevation is read and printed. If peaking capacity is to be computed as a function of outflow, a table for that purpose is read and printed. If specified, a table of plant efficiency (if EFFCY is -1) or power per unit of flow (if EFFCY is -2) is read and printed. If the power requirement is not to be different every year, it is read as a power amount, if positive, or as a plant factor, if negative. Proper conversion is made immediately. If this power plant is in a power system operation, it is identified with the system, and the system plant count is incremented. A branch back is made to the next control point data if there is a downstream control point. When all control point data have been read, a summary of upstream reservoirs serving each control point is made for later printout.

SECTION J: The scratch tape is rewound at this point and input data that changes from year to year is written so that it can be retrieved repeatedly for optimization runs.

8. SUBROUTINE COMP DESCRIPTION

This subroutine is called from the main program for the purpose of performing the detailed system computations for an entire year.

Section A: The level at the bottom of flood-control space is computed, and the constant to convert the product of flow, head and efficiency to kilowatts is established. The DO-loop for a year of computation intervals is started, and this DO-loop constitutes practically the entire subroutine. A number of constants are established. NC is set to zero in order to count iterations through the system for successively adjusting average power head and lake areas. Plant power requirement (POWR) is then stored as system contribution by that plant (PWER) for the first iteration and evaporation is converted to feet if it is given in inches. Indicator IPX is set to zero for each power plant. Subsequent values of 1 will indicate that releases are controlled by system power requirements.

SECTION B: This section is used to declare shortages if operation criteria provide for reducing services when the aggregate storage in specified reservoirs is below a specified quantity. Storage deficiency

is first computed and then multiplied by a given ratio to obtain the proportion by which diversion quantities are to be reduced. The process is repeated for reducing river flow requirements. The new target flows are designated QDIVS for diversions and QMINS for river flows. Target river flows are not permitted to be lowered below minimum flow requirements.

SECTION C: This section starts each iteration through the system for successively approximating average power head and reservoir area for the computation interval. For each control point, an initially large value is set for QMAXA, which is the largest flow physically possible and usually corresponds to outlet capacity at reservoirs. Then for reservoir control points only, the following things are done. Storage at the start of the interval is set as the average storage for the first iteration. The rating table for each reservoir is searched with the average storage and area; outlet capacity and pool elevation are interpolated from the table. Evaporation for the interval is computed. In the very first computation interval for the job the current elevation is stored for the preceding interval in the event that the reservoir is downstream of and controls tailwater at an upstream power reservoir (see Section E). When power is specified as a function of the head or storage, power coefficients are interpolated from the table. The main DO-loop for determining system operation is then started.

SECTION D: The target flow for each successive control point is designated as QA and the controlling condition (ICSE) is defined as flow target at the same control point. Whenever this target flow is changed later, the controlling condition is reidentified. The variable TMPP is then designated as the equivalent desired (nonpriority) flow. Return diversion flows, if any, are then identified, and total diversion (QDIVR) above each control point and below all reservoirs immediately upstream is computed.

SECTION E: For reservoirs, the maximum release (QOTMX) is set equal to the smaller of the outlet capacity and the downstream channel capacity. For nonreservoir control points, the QOTMX must be adjusted for safety allowance (QL*CFLOD) for flood control and the safety allowance (QL*CLOCL) already included in all computations of QOT. For all control points, this quantity is allocated as a constraint on releases from upstream reservoirs. For each reservoir level, the total upstream release plus local runoff and minus local diversion is computed. This quantity is constrained by constraints previously placed on upstream reservoir releases and previously committed releases where conservation releases are given a priority over flood-control release curtailment (where ICONS is 1). Maximum release from each upstream reservoir is then established as the release interpolated between adjacent levels that causes capacity at the current control point to be exactly equaled if any storage at the control point is filled. The minimum release

(QOTMN) is set at the leakage value (less scheduled diversions, because this is to be increased later by any diversion shortage that occurs).

SECTION F: The variable TMPPR is set as release required for power generation. For power computation, tailwater elevation, if specified as zero, is computed as a function of outflow. If so indicated, tailwater elevation is taken as the elevation of the downstream reservoir plus 2 feet (0.6 meters) unless a specified tailwater elevation is higher. On the first iteration, since the downstream reservoir elevation has not yet been computed, it is necessary to use that for the preceding period. Power head is then computed and the amount of flow (TMPP) needed to produce required power is computed. If this flow exceeds that needed for other purposes, it will be stored in the QA array and the controlling condition respecified. For cases where power head is a function of release rate (usually at run-of-river plants), a provision is made to cycle back within this section to make a more accurate estimate of flow required for power generation.

SECTION G: A quantity, QO, is computed to represent the release from this reservoir that would drain the reservoir to a specified level with no contribution from upstream reservoirs. Later, a quantity QOT will represent the release if all upstream reservoirs were drawn to the same level, subject to previously imposed constraints. QOMN is a minimum value of QO committed at any time and is initially set at full reservoir value. When a reservoir is not intended to serve some specific downstream purpose, this quantity will be held constant as a contribution by the reservoir. Next, actual diversion is computed for areas without reservoirs by shorting diversions where the total requirement for diverted water (QDIVR) exceeds available local runoff.

SECTION H: In preparation for computing total flow obtainable by drawing on upstream reservoirs, subject to constraints, upstream reservoirs that can be called upon are identified by a positive value of IOPER. The highest level (LCNS) below which full conservation releases are permitted when they cause channel capacity exceedence is then established. Since reservoirs might be operated differently for each downstream control point, it is necessary to compute QOT for all reservoirs at or above a control point in order to establish proper quantities for that control point. This is done for each reservoir by adding QO at the reservoir to QOT values already computed for all reservoirs immediately upstream. These quantities are to be used for allocating releases to meet downstream requirements. Similar quantities are needed for later allocating system power requirements, except that they must be constrained by power plant capacity releases within the period of system load and system reservoirs can all be called upon regardless of whether they operate for the control point requirements. Because of these two differences, QOT to be used for later system power allocation is computed separately and temporarily stored in the PG array.

SECTION I: A check is made for cases where the operation of upstream power system reservoirs after the first iteration is to be frozen in order not to overgenerate (except to prevent overfilling the reservoir). This is only done if the upstream reservoir release is controlled by system power requirements and even then it is done if usable storage at the control point would otherwise be exhausted (L = 2). A check is then made to assure that QOT at upstream reservoirs at least equals leakage at all levels below full reservoir. QOT is constrained to committed conservation releases at levels below flood control space, then to maximum permissible release, and then not to be less than QOT at the next higher level. This last check is to assure that previously imposed constraints do not cause the reservoir to over fill. Special checks are made for QOT at the top level (L = NL) to assure that it is not less than leakage minus scheduled diversions at the current control point and to constrain to controlled spillway releases if surcharge is permitted. A further check is made to assure that previously committed conservation releases are made if they are given priority over maintaining flows within channel capacity (ICONS = 1). Then a routine is provided for diverting all spills through diversions if desired. If not, maximum permissible release is raised as necessary to prevent exceeding reservoir and permissible surcharge storage capacity.

SECTION J: For nonreservoir control points, QOT is computed by adding QOT for all reservoirs immediately upstream to local flow (adjusted for contingency allowance) and subtracting committed diversions in the local area. The optional diversion spill routine is then included for these nonreservoir control points. An optional diagnostic printout is provided, which permits a coarse trace of system computations. Diversion shortages are indicated when QOT at the bottom of usable space (L = 1 or 2, depending on whether or not diversion has priority) is less than leakage. If so, desired diversion quantities are shorted by an amount necessary to provide water for leakage, if any. If diverted quantities are changed, then QOMNA and QOMNB, the physical limits of QO, just be changed accordingly, and QOMN maintained within those limits. QOT values must also be changed in accordance with the diversion change, and its logical limits checked.

SECTION K: The level to which upstream reservoirs must be drawn (subject to previously imposed constraints) in order to provide the desired flow is determined by searching QOT values for the control point. If this is below level 2, priority releases are identified, and the amount of draw-down below level 2 in order to provide priority release is computed. If the desired level is below the bottom of the flood control space, a transfer is made directly to the conservation release routine (Section M).

SECTION L: If the desired level is above the bottom of the flood control pool (L = NFL), the indicator IFC is set to 1 and a transfer made to the conservation release routine in order to identify releases that

would otherwise be necessary for conservation purposes. After return to the flood release routine, a target release is set that equals permissible release minus any contingency allowance for flood control. The level within the flood control space that would correspond to that release is then determined. Releases for all upstream reservoirs are computed, and, if they are changed a new control condition (flood control) is identified. A new value of QOMN is set to correspond to any release changes and checked against permissible limits. This variable can be used later to freeze the storage change when the reservoir is not to be called upon to serve a specific requirement downstream. The lower limit QOTMN is also reset. An optional diagnostic printout is provided.

SECTION M: Conservation releases at all reservoirs at or above the control point are made in this section if the desired level is below the flood control space. Corresponding values of QOMN and QOTMN are also reset. If releases at any reservoir are changed, the new control condition is identified. The new release is identified as a conservation release, and an optional diagnostic printout is provided. Then for nonreservoir control points, the resulting flow is computed. If this is negative, the diversion is reduced by that deficiency and the river flow and conservation flow are set to zero. This section ends the loop for determining reservoir releases.

SECTION N: Inflows and preproject (without reservoirs or diversions) flows are computed for all control points. End-of-period storage is computed for all reservoirs. If it is negative, it is because evaporation was too large, so the evaporation is corrected by the shortage, and storage is set to zero. Average storage for use during the next iteration is computed as the average of starting and ending storage for the period. End-of-period elevation is determined from the end-of-period storage. Power peaking capacity is set to plant capacity plus overload or, if it is a function of head or outflow, it is interpolated on the basis of monthly average storage or outflow respectively.

SECTION O: It is possible that conservation releases have been adjusted or changed in such a way that contributing reservoirs were not fully identified. It is then necessary to check the entire system starting at the downstream end and allocating conservation releases to upstream reservoirs. In order to do this, it is necessary to interpolate between upstream flows already identified as conservation releases and total releases at each reservoir in turn. Power is computed from the actual release, making sure that the actual release is not exactly zero, because it later will be used as a divisor in system power computations.

SECTION P: System power requirement is distributed among reservoirs in each system in turn. For each system, the power already generated

and usable for that system load (PGAU) is computed. For the first iteration (IC = 1), this quantity for each plant is tentatively stored as power requirement (PWER) for the next iteration, unless it is less than the basic at-site requirement (POWR). Then the usable power that could be produced by drawing all reservoirs down to each successive level is computed. This is accomplished by multiplying the power generated (TMP, which has not been constrained to plant capacity) by the ratio of PG, representing to this point the flow resulting from drawing all reservoirs to the specified level, to the actual release computed thus far (QA - QLKG). Resulting values are stored in the same PG array. This is constrained by plant capacity at system load factor and peaking capability at the upper end and by at-site requirement at the lower end. Total values of assigned system requirement (PWERT), at-site requirement (POWRT) and generated and usable power (PGAUT) are then calculated for that system. Also, the system total power that would be developed by drawing all reservoirs down to each level is computed. These latter values are searched to determine the level of drawdown required to develop system power.

SECTION Q: System power requirement is assigned to each plant so as to draw the reservoirs down to the level determined above and, if this assigned value of PWER equals or exceeds power already generated (TMPP, unconstrained by plant capacity), IPX is set to 1 to indicate that releases on the next iteration will be controlled by system power requirements. If there is sufficient storage to produce system power and if releases for other purposes do not force assignment in excess of system power, then the power allocation computation is finished. Otherwise, system total values of capability (TMPA), at-site requirement (TMP), and newly assigned system power (TEMP) are computed. If the assigned total is less than system requirement, an increased assignment is made by interpolating between assigned values and plant capability. These assigned values cannot be met, but shortages will be assigned to plants on this basis. If the assigned total is greater than system requirement, a decreased assignment is made by interpolating between assigned values and at-site requirements. This completes the power allocation and the next complete system computation (iteration) can be performed.

SECTION R: A quantity CTX is established for computing annual power quantities in order to obtain a direct sum (CTX = 1) if quantities represent energy units (such as kw-hr) or to obtain an average if quantities are in power units (such as kw). Generated power at each plant is constrained by plant capacity and annual values of power (SYPWR), at-site requirement (SYPR), system requirement (SYSP), system shortage at each plant (SYSYS) and at-site shortages (SYSHP) are computed. The number and maximum amount of shortages is established. System total values of generated power, requirement and shortage are computed and annual values obtained.

SECTION S: Annual reservoir evaporation is computed and end-of-period storage is assigned as state-of-period storage for the next period. A count is made of the number of periods that storage is within specified ranges of the conservation storage (minimum pool to bottom of flood-control pool for that month). The exact reference level for each reservoir is computed. Flow shortages are computed, counted and summed for the year. The maximum shortage is established. This is done separately for desired flows and required flows. Annual values for other flow quantities are also computed. Diversion shortages and annual values are determined. For return flows, this computation is bypassed. This completes all computations for the year and a return is made to the main program.

## 9. SUBROUTINE ECON DESCRIPTION

This subroutine is called from the main program to read benefit functions in tabular form relating economic values to hydrologic quantities, to evaluate benefits for the various purposes at specified locations and to summarize the benefits in various forms usable by planners and managers.

SECTION A: The number of items in each table of economic functions (NL) is set at 8 and the maximum number of economic functions (NE) for any control point is also set at 8. Control-point numbers and names read in the main program are printed. All economic function names (types of benefits) are read and printed. The variable, NEA, is set to zero to compute the total number of types of economic functions used. The DO-loop for computing benefits for each economic function is then started. The year name, IYRA, is set to the first year of the operation study (obtained from the main program). Before reading each type of benefit function for all control points, an indicator JTMP is set to zero to print the word "none" later if that type of function is not used at any control point. In the control-point DO-loop, some benefit summation values are initialized to zero for later accumulations. If a benefit function is called for by the IE indicator for any control point, the variable MTH is set to zero and tables are read and printed. If the control point identification on the tables is wrong, a note to that effect is printed and a return is made to the main program, by-passing the economic routines. The maximum tabulated benefits for each month are added to obtain yearly maximum benefits, VMAX. If the month number indicated on the benefits table is larger than the current month, I, tables for all months up to that one are equated to that table. A value of VLEFT for each function and control point is initiated at maximum annual tabulated benefits for later determination of remaining benefits.

SECTION B: The DO-loop for each year is started (within the benefit type DO-loop). If IECON exceeds 1, unallocated monthly benefits are to be printed. Then some summation variables are initialized to zero and the control-point DO-loop is started (within the benefit and year DO-loops).

Monthly allocation ratios for each reservoir at and above the control point are read, and total change in flow from preproject conditions for each month is read from tape 3. Then a second DO-loop for benefits functions is constructed within the three existing DO-loops.

SECTION C: The indicator IB is negative to indicate that this is the first pass through the routine for this benefit function. The hydrologic quantities for each month are read into the Q array. A month DO-loop is used to look up the benefit value for that month's hydrologic variable, and the benefit value is stored in the TMPP array. Hydrologic quantities that correspond to the benefit type designated by the outer DO-loop are read from tape 3, by-passing other hydrologic quantities on tape 3. When by-passed quantities are flows (IE = 1), it is necessary to read tape 3 twice for project and preproject flows. The benefit for each interval is added to the V and VU arrays to determine total value under allocated and unallocated conditions. The benefit is also entered in the BEN array to obtain the gain in benefits with the project. Some sums are obtained, and benefits are subtracted from the VLEFT array to obtain remaining benefits. When the month DO-loop is completed for any benefit function not based on streamflow (IE $\neq$ 1), monthly benefit printout is made, if specified, and computation for that benefit function is complete. If the benefit function is based on flow, the negative value of IB causes a transfer back to compute benefits that would occur without reservoirs. At this time, IB is set to zero and reservoir effects are subtracted from flows. Benefits are obtained from the benefits tables for each modified flow and stored in the TMPP array. These are then subtracted from those previously computed that were stored in the BEN array, and the differences are stored in the same array. After this is done for every month, the computed increase in benefits is allocated to upstream reservoirs, if there are upstream reservoirs. The remaining project benefits are then stored in the BEN array. A branch back for computing preproject benefits is made. IB is set to 1, and preproject flows are read from tape 3 and stored in the Q array. These are used to compute preproject benefits, which in turn are subtracted from the project benefits (BEN) and the difference stored in the BEN array. The preproject benefits are also subtracted from the V and VU arrays. Monthly benefits are then printed, if specified. When the control-point DO-loop is completed, total monthly benefits are printed, if specified. The year counter is incremented, and the year DO-loop continued. After the year DO-loop is completed, the number of economic functions actually used (NEA) is checked, and the economic functions DO-loop is continued. When it is completed, NE is set to NEA for efficient printout control.

SECTION D: Benefits are next printed, as indicated in headings. Sums are initiated at zero, and a variable TMP is the reciprocal of the accumulated number of years of benefits. The unallocated benefits (VU) are multiplied by TMP (to obtain average annual values), sums for all types of benefits are computed, and the resulting quantities are printed.

Next, allocated benefits (V) are multiplied by TMP to obtain annual values, sums for all benefits are computed, and the resulting values are printed.

Next, total benefits obtained by project operation, including all values obtained without (before) the project, are computed from VMAX (maximum tabulated benefits) and VLEFT (benefits left or unattained) and stored in the V array. Sums are computed and quantities are printed.

Total potential benefits (VMAX) consist of maximum tabulated quantities in the benefits tables. These are added and printed. Remaining benefits (VLEFT) are potential benefits minus benefits attained with the project. These are added and printed. A return to the main program is then made.

10. SUBROUTINE REARNG DESCRIPTION

This subroutine, which is called only once from the main program, accepts output data retrieved by subroutine BINTP, designates the rearranging to be done and print formats to be used, and sends it to subroutine OUTPT for rearranging and printout. The common statements contain variable names that are convenient to this subroutine and not necessarily the same as in other segments. These are designed to automatically store in memory the quantities transferred from one subroutine to the other. It should be noted that DLTA1 overlaps intentionally into DLTA2 and DLTA3, whose variables are not used in the program. Care must be taken to be certain that DLTA1 occupies the low order address. Functions to be arranged that are designated by the subscripted variable IRG in the main program are here designated I1 to I10 corresponding to IRG(1) to IRG(10).

Format specification for key printout in subroutine OUTPT is placed in storage here to facilitate the designation of format when calling OUTPT. Each time that OUTPT is called, one format starting with I, one starting with J, and one starting with K are used.

After slewing printer to a new page, ICND is set to zero to indicate that BINTP is being called for the first time. In the event that the study contains more than 50 years of output, only the first 50 years are accepted due to memory limitations, and a message is printed stating this.

The statements starting IF (I1.LE.0) for I1 through I10 then provide for rearranging each of the 10 variables in turn, as specified and as described in the following paragraphs.

If I1 is positive, BINTP is called with a zero value of ICND as the argument. The second argument is KCPT because the variable being

rearranged is subscripted for each control point. The study title and name of the variable being rearranged are printed. Then OUTPT is called. If the value of I2 is 1 or 3, data are arranged by year for each control point. If I2 is 2, data are arranged by control point for each year. If I2 is 3, it is changed to 2 upon the first return and OUTPT is called again in order to produce both arrangements.

The identical procedure is used for the next six variables, I2 through I7. The variable ICND is changed to 1 in BINTP the first time it is called.

Variable I8 is storage change, and it is obtained from variable I7, storage at end of interval. BINTP is called only if it has not already been called for variable 7, to read storage. The storage changes are computed by subtracting the end-of-preceding-month storage from end-of-current-month storage and placing in ARRAY. Likewise the end-of-preceding-year storage is subtracted from the end-of-current-year storage and placed in AVG. Then OUTPT is called for earlier variables (I1 through I7).

Variable I9 is treated exactly as are I1 through I7.

Variable I10, if positive, calls for rearranging a combination of quantities associated with reservoir operation. BINTP and OUTPT are not used for this. If I10 equals 2, only data for reservoirs having power plants are to be rearranged. Headings are printed and then a year of data are read from tape (after rewinding 1). If power is to be printed in kilowatts instead of thousand kilowatt hours, the conversion is made for locations having power plants (IPWR positive). For locations without power plants, the power operations are bypassed, and different print statements are used. Rearrangement under I10 is for all years for one station at a time.

## 11. SUBROUTINE OUTPT DESCRIPTION

This subroutine is called from subroutine REARNG each time that a different variable is to be printed out in a particular rearranged form. Data obtained in REARNG are placed in the arrays ARRAY and AVG and transferred in common with common statements DLTA1, DLTA2 and DLTA3 used only for ARRAY, using dummy variables and intentional overlap. In the subroutine name argument, ITST contains information pertinent to which variables are to be printed in rearranged form, IND gives arrangement information; and IFMT, JFMT and KFMT are format specifications composed in subroutine REARNG.

The subroutine contains two main parts. In the first part, printout is by years for each location (year DO-loop inside location DO-loop), and

printout in the second part is by location for each year (location DO-loop inside year DO-loop). If IND is 1 or 3, the first part is used, and if IND is 2, the second part is used. When IND is 3, it is changed to 2 in subroutine REARNG as the printout for the first part is completed, so that both arrangements are printed out.

If ITST is 1, variables printed in turn are unregulated flows, river flows and desired flow shortages, for which quantities are available at all control points. Consequently, headings are printed without further testing, and quantities for each year are printed. Averages are computed for each calendar month at each station and are printed before printout for the next station starts.

If ITST is 2, variables printed in turn are diversion and diversion shortage, and these are available only for control points having a nonzero value for IDIV. Headings are printed for these control points, and data are printed exactly as for the cases where ITST = 1.

If ITST is 3, minimum-flow shortages are printed for locations having minimum-flow requirements specified (where QM2 is nonzero). Headings are printed for these locations and quantities are then printed as for those where ITST = 1.

If ITST is 4, change-in-storage is printed for all reservoir locations (IRES positive). If ITST is 5, end-of-period storages and elevations are printed in turn. Operations are the same for both of these and similar to operations described above. For change-in-storage, totals for each calendar month are printed, whereas averages are printed in the cases of storages and elevations.

In the second main part of the program, operations are the same as described above for the first part, except as noted for arrangement and except that headings need not be repeated.

## 12. SUBROUTINE BINTP DESCRIPTION

This subroutine is called from subroutine REARNG, each time that a rearranging operation is to be performed. Its purpose is to retrieve information from tape 4 that is needed for rearranging into convenient summaries at the end of a simulation study.

Large arrays are set up in common with unrelated variables in other segments of the program simply as a convenient means of managing the rearranging without using extra memory space only for this purpose. It should be noted that one array (ARRAY) overlaps intentionally into two more common areas that are reserved for this purpose.

Variables to be rearranged (and only those to be rearranged) were written on tape 4 in the main program. For this reason, the number of tape records to be skipped in order to arrive at the information to be read from tape 4 must be calculated. This is done the first time that BINTP is called (when ICND = 0) by counting the number of variables to be rearranged (ID) and identifying the storage sequence number of each variable to be retrieved (IND(I)). It should be noted that Variable 8 is change-in-storage. These will be calculated in REARNG from end-of-period storage values (Variable 7) which need be read only once. Also, retrieval of Variable 10 data is accomplished in REARNG without calling BINTP.

Values of IRG are first searched to find the first variable to be rearranged. As soon as one is found, its value of IND(I) is set to zero to signify that it will have been rearranged when the next search is made. Tape 4 is then rewound, and the annual and monthly information is read from tape on year at a time. This sequence of read operations is done for as many other variables as there are to be rearranged. In this operation, IDN is the number of records to be skipped before reading the desired information each year, and IDNN is the number to be skipped after reading the information that year. As soon as data for all years are read, ICND is set to 1 to signify that subsequent calls for BINTP are not the first call, and a return to REARNG is made.

When BINTP is called after the first time, a transfer is immediately made to search for the first subscript of IND(I) where the value is positive, which signifies the next variable to be read from tape. Then IDNN is set to the number of variables to be rearranged later, and IDN is computed as the number of variables already rearranged. If variable 9 is being rearranged, IDN is reduced by 1 when both variables 7 and 8 have been rearranged, because they use the same tape record each year. The tape is then rewound and for each year, IDN records are skipped, a record is read, and IDNN records are skipped. In the case of reading variable 9 (elevation), annual totals or averages are not used, so the read format is different, as shown in the listing.

# PROGRAM USAGE

## PROGRAM USAGE

### 13. USE OF TAPES

Input and output are controlled by read and write statements using logical tapes 5 and 6 respectively. Other tapes are used in the binary mode as scratch tapes only. Tape 4 is used in subroutine INOUT as a "reread" unit. Because cards may be omitted for default values, the order of the data may vary. Cards are read, identified and written on tape 4. Identification is made from the two-character code in columns 1 and 2 and is used as a means of determining the sequence of the data as it is written on tape 4. The sequence is then used to read from the tape. Tape 2 is used for saving all annually changing quantities, which are retrieved in the main program as needed. Tape 4 is again used with tape 1 in the main program for writing output information to be rearranged. Two different tapes are used, because the type of rearranging is different in different operations, and it is necessary to store a year of data at a time on tape 1 due to limiting array sizes. They are read in BINTP and REARNG. Tape 3 is used in the main program for writing data needed in the computation of economic benefits in subroutine ECON.

### 14. CHANGES OF DIMENSIONS

Changes of dimensions of variables may be required if systems are studied that are larger than can be accommodated by the programs as written. Also, dimensions may be reduced to minimize the use of core space in the computer. When changes are made, dimensions of all variables having a common dimension and the dimension limit should be changed identically.

If the number of computation intervals per year (KPER) is changed, care must be exercised to assure that input specifies the changed number of days in each computation interval. While monthly intervals are normally used, any regular or irregular interval can be used.

In changing dimensions, it should be recognized that the number of reservoirs or the number of diversions cannot exceed the number of control points, and that the number of power plants cannot exceed the number of reservoirs.

It is good practice to use a unique dimension for each set of variables so that future changes can be made easily and so that mistakes are reduced.

Groups of variables that should have uniform dimensions are tabulated below along with the corresponding dimension limit.

KCPT (40): ARRAY, AVG, CNTRL, CPT, ICPT, ICSE, IDIV, IDIVR, IE, IEV, IOPER, IPRN, IPWR, IRES, IRESM, ISHQ, ISRCH, ISYSR, IUPQI, IUPST, NDIVR, NFLW, NRESR, NSH2, NSHMN, NSHP, NSHPS, NSTOR, NUPQI, NUPST, Q2NDX, QA, QCONS, QDIVR, QI, QII, QINDX, QL, QLKG, QM2, QMAXA, QMIN, QMIN2, QMINA, QMINS, QMX, QOUT, QOTMX, QPREP, SCNS, SHMX, SHMX2, SHPMX, SHRT2, SHRTQ, SPSMX, SQ, SQA, SQI, SQL, SQMN, SSH2, SSHQ, STORL, SYCNS, SYPRE, SYQ, SYQA, SYQI, SYQL, SYQMN, SYSH2, SYSHQ, TMPP, V, VLEFT, VMAX, VU.

KRES (30): AREA, CEVAP, EFCY, EL, ELEV, EVP, EVTMP, IRESM, ISERV, ISHR, NSERV, PG, QCAP, QO, QOMN, QOMNA, QOMNB, QOTMN, SEVP, STOR, STORI, STORA, STORB, STRAV, SYEVP.

KDIV (25): DINDX, IDBAS, IDIVR, IDV, ISHDV, NDVSH, QDIV, QDIVA, QDIVS, RTIOD, SDIV, SDV, SDVA, SHDMX, SSHD, SYDV, SYDVA, SYSHD.

KPWR (20): CQOEL, HEAD, IDPR, IPOW, IPR, IPX, IRESP, OVLOD, PFMAX, PGAU, PKPWR, POWR, POWRP, PWRMX, QT, SYSSP, TL, TLWEL, TWEL.

KPWRS (2): IRESP, NRESP, NSRTP, PG, PWRS, SYMSP.

KPWR + KPWRS (22): PINDX, POWER, PWER, SHRTP, SPMX, SPR, SPWR, SSHP, SSP, SYPMX, SYPR, SPYWR, SYSHP, SYSP, SYSYS.

KPER (12): APERD, APRD, ARRAY, BEN, CNTRL, CSTI, CSTO, ELEV, EVAPO, EVP, ICSE, IPER, ISTOR, NDAYS, NSTOR, POWER, POWR, POWRP, PWER, PWRS, Q, QL, QCONS, QDIV, QDIVA, QDIVS, QI, QII, QL, QMIN, QMIN2, QMINA, QMINS, QMX, QPREP, SHDIV, SHRT2, SHRTP, SHRTQ, SM, STORB, STORL, SYSSR, TEMP, TMPR, TMPX.

KSERV (19): ISERV.

KUPST (18): IUPST.

KUPQI (10): IUPQI, NUPQI.

KL (8): PG, PGT, QO, QOT, STORL.

KQIL (90): MQ, RTIO.

Several dimensions are fixed in the program and can be changed, but a very careful check must be made to assure that corresponding changes are made at all pertinent points in the program.

Of particular importance when any changes of dimensions are made is to check the sizes of three common statements labeled DLTA and the common statement labeled GAMMA in the main program to assure that space needed and the dimensions of ARRAY and AVG are consistent in subroutines BINTP, OUTPT and REARNG with dimension space in the main program.

# EXHIBIT 1

## FLOW CHART

# GENERAL FLOW CHART

# RESERVOIR SYSTEM ANALYSIS

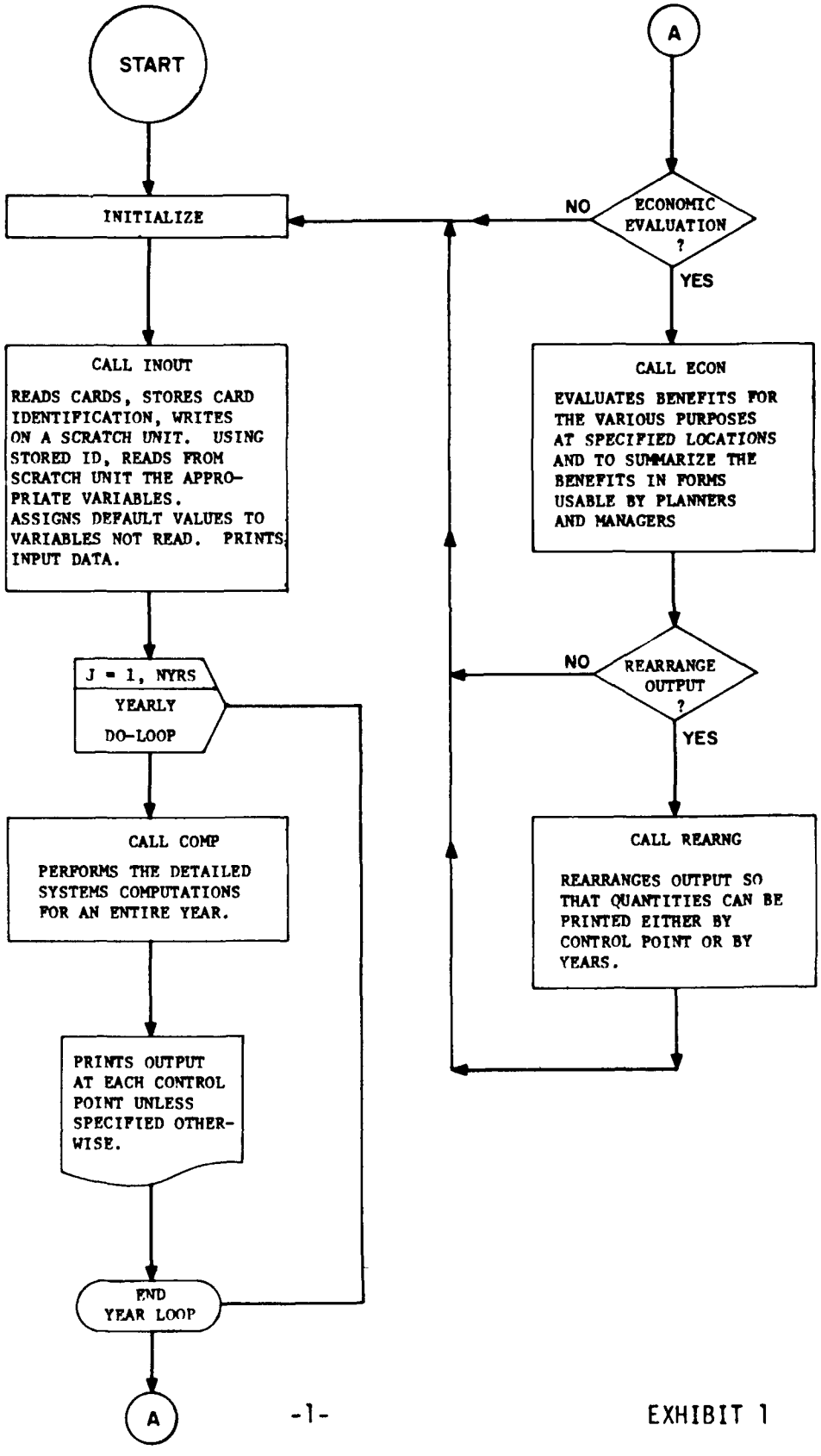




EXHIBIT 1

# FLOW CHART
# RESERVOIR SYSTEM ANALYSIS
# MAIN PROGRAM

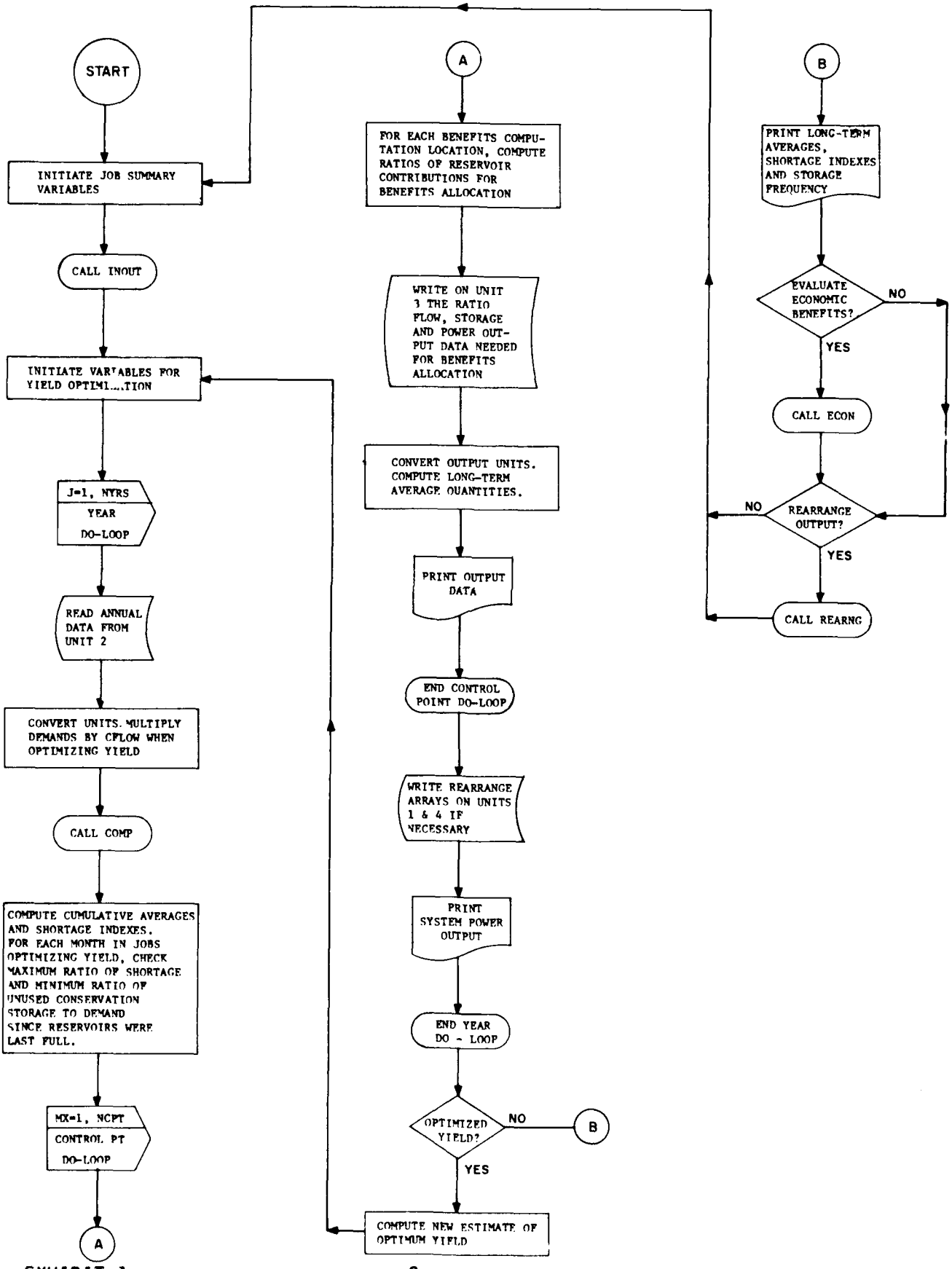


EXHIBIT 1

# FLOW CHART
# RESERVOIR SYSTEM ANALYSIS
# SUBROUTINE COMP

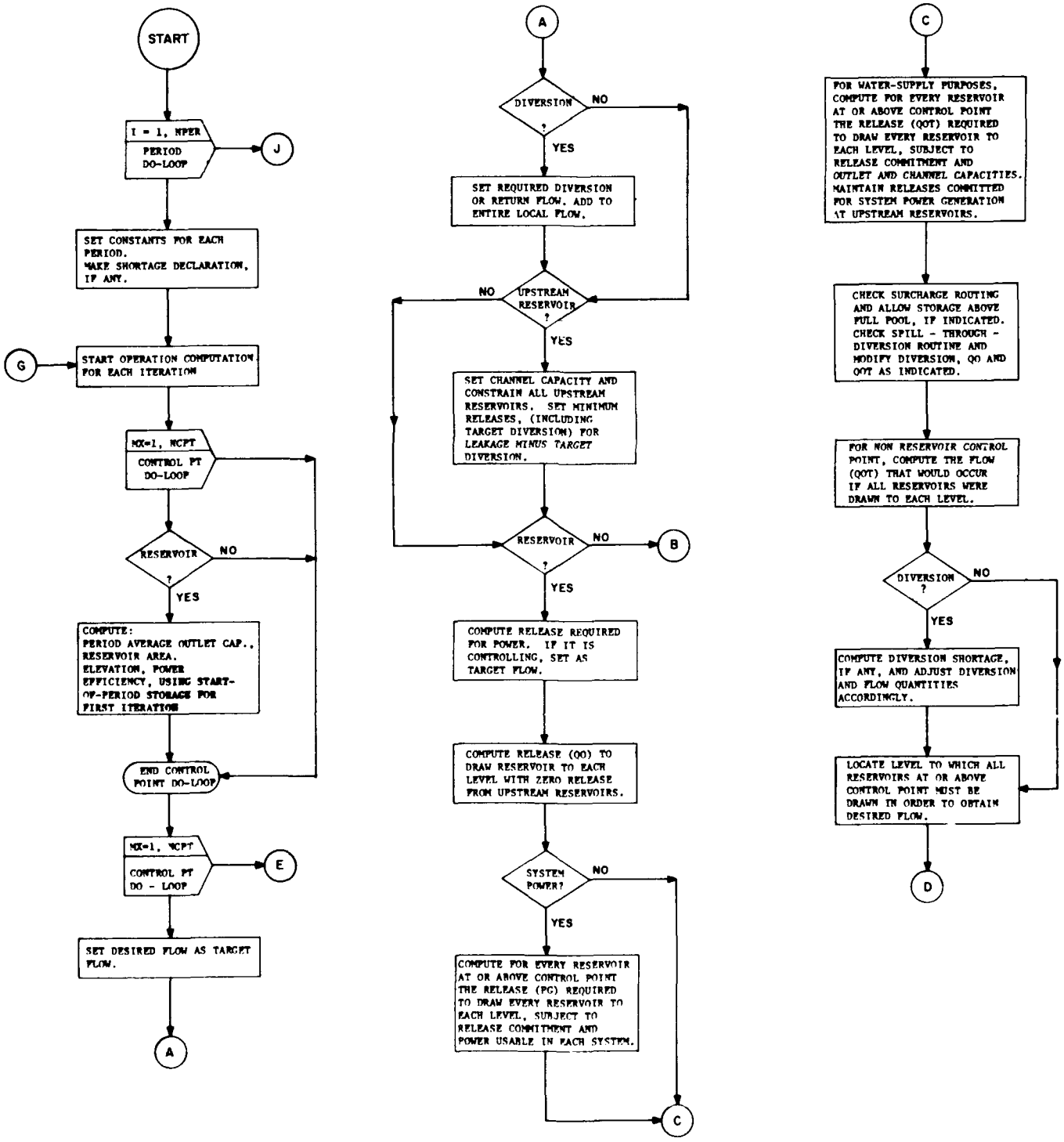




EXHIBIT 1

# SUBROUTINE COMP (Cont'd)

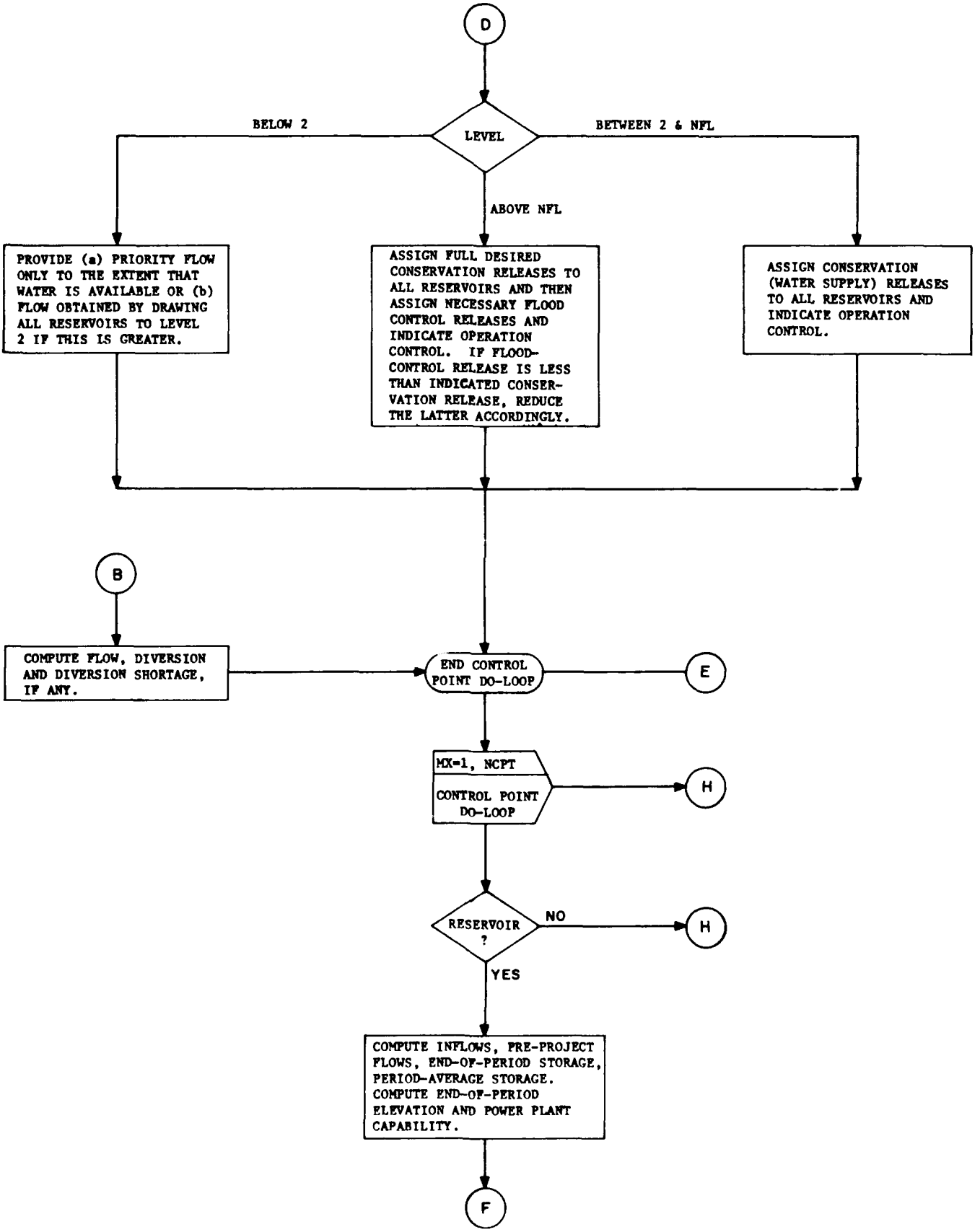


EXHIBIT 1

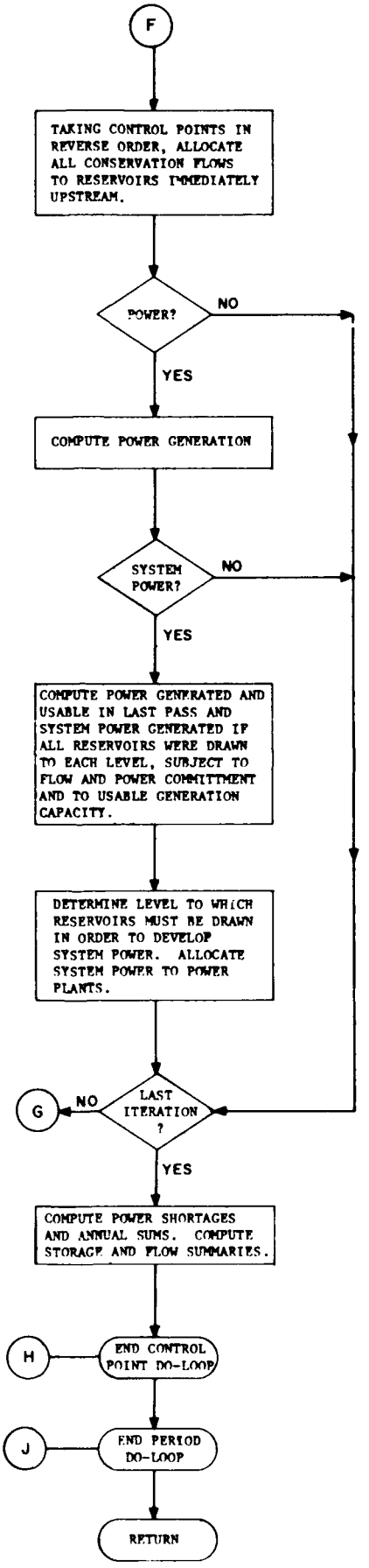
F
TAKING CONTROL POINTS IN REVERSE ORDER, ALLOCATE ALL CONSERVATION FLOWS TO RESERVOIRS IMMEDIATELY UPSTREAM.
POWER?
NO
YES
COMPUTE POWER GENERATION
SYSTEM POWER?
NO
YES
COMPUTE POWER GENERATED AND USABLE IN LAST PASS AND SYSTEM POWER GENERATED IF ALL RESERVOIRS WERE DRAWN TO EACH LEVEL, SUBJECT TO FLOW AND POWER COMMITTMENT AND TO USABLE GENERATION CAPACITY.
DETERMINE LEVEL TO WHICH RESERVOIRS MUST BE DRAWN IN ORDER TO DEVELOP SYSTEM POWER. ALLOCATE SYSTEM POWER TO POWER PLANTS.
G
NO
LAST ITERATION ?
YES
COMPUTE POWER SHORTAGES AND ANNUAL SUMS. COMPUTE STORAGE AND FLOW SUMMARIES.
H
END CONTROL POINT DO-LOOP
J
END PERIOD DO-LOOP
RETURN



EXHIBIT 1

## SUBROUTINE INOUT

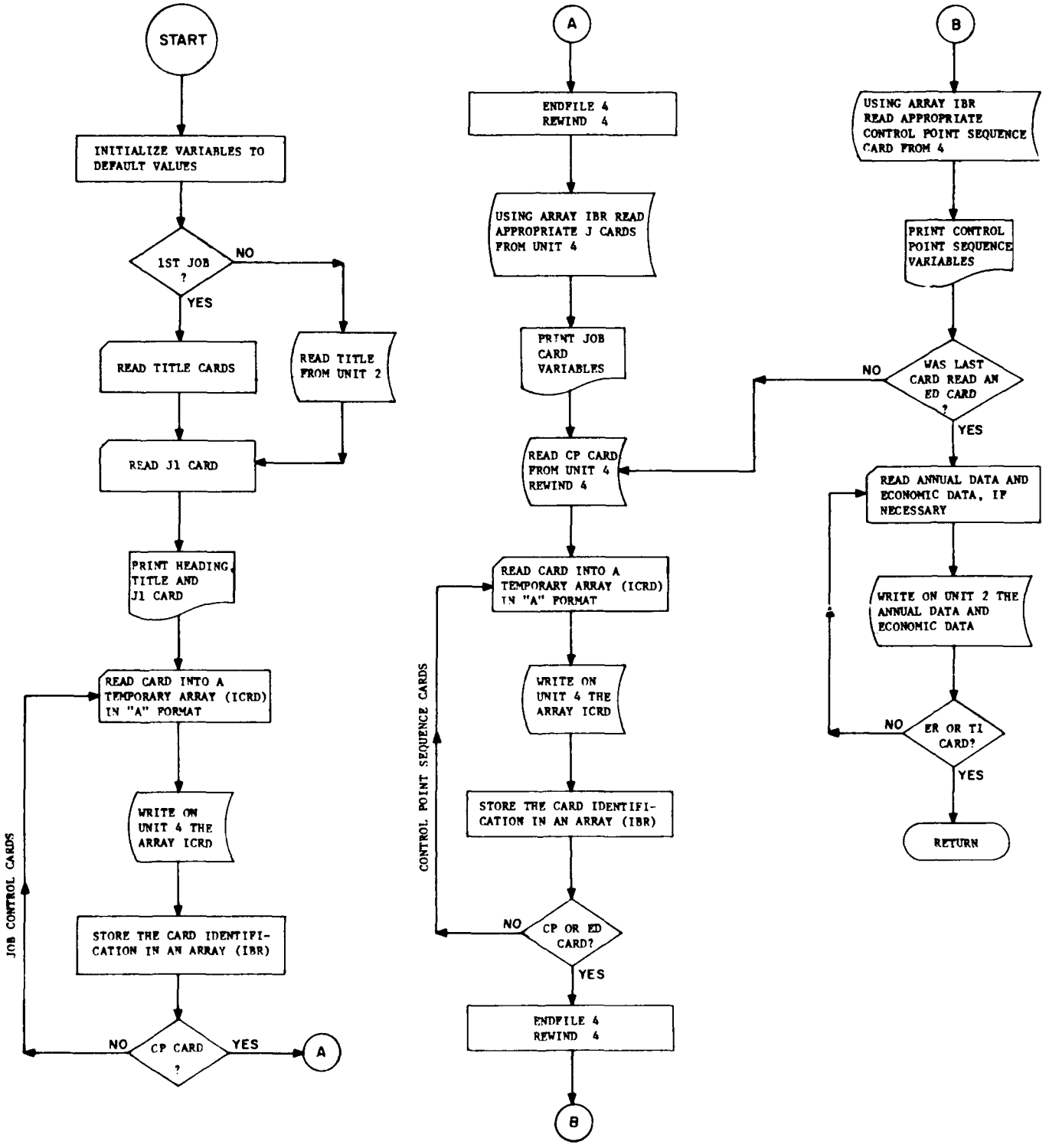


EXHIBIT 1

# EXHIBIT 2

## VARIABLE DEFINITIONS

A(K) = BENEFIT FUNCTION NAME
AL = STORAGE LEVEL AT RESERVOIRS ABOVE A GIVEN POINT AT A GIVEN TIME
AMOS = DEFAULT NAMES OF TIME INTERVAL(EQUATED TO APRD)
ANDYS = NUMBER OF DAYS IN A GIVEN COMPUTATION INTERVAL
ANYR = NUMBER OF YEARS ROUTED ALREADY, EXCLUDING CURRENT YEAR
ANYRS = NUMBER OF YEARS ROUTED ALREADY , INCLUDING CURRENT YEAR
APERD(I) = NAME OF TIME INTERVAL (FIRST PART)
APRD(I) = NAME OF TIME INTERVAL (REMAINING PART)
AREA(M,K) = TABLE VALUE OF AREA IN ACRES FOR RESERVOIR M
AREAV = AVERAGE RESERVOIR AREA IN ACRES DURING PERIOD
ARRAY = TEMPORARY ARRAY FOR STORING ITEMS TO BE REARRANGED
ATMP = TEMPORARY VARIABLE
AVE(I) = AVERAGE QUANTITY DURING INTERVAL I FOR PERIOD OF STUDY
AVG = TEMPORARY LOCATION FOR THE AVERAGE OF ITEMS TO BE ARRANGED
BEN(I,J) = BENEFIT IN DOLLARS FOR TIME INTERVAL I AND FUNCTION J
BLNK = HOLLERITH CODE FOR BLANKS
CACFT = COEFFICIENT TO CONVERT FROM ACRE-FEET (THOUSAND CUBIC METERS FOR METRIC SYSTEM) TO DESIRED UNITS
CCFS = COEFFICIENT TO CONVERT FROM CFS (CMS FOR METRIC SYSTEM) TO DESIRED UNITS
CEVAP(M) = COEFFICIENT OF BASIN REFERENCE EVAPORATION (EVAPO) FOR RESERVOIR M
CFLOD = COEFFICIENT GREATER THAN 1 BY WHICH LOCAL INFLOW BELOW RESERVOIRS IS MULTIPLIED TO PROVIDE CONTINGENCY ALLOWANCE FOR FLOOD CONTROL RELEASE DETERMINATION
CKW = CONVERSION CONSTANT TO CONVERT FLOW TIMES HEAD TO POWER/DAY AT 100 PERCENT EFFICIENCY
CFLOW = COEFFICIENT TO ADJUST YIELD TOWARD OPTIMUM
CLOCL = COEFFICIENT LESS THAN 1 BY WHICH LOCAL INFLOW BELOW RESERVOIRS IS MULTIPLIED TO PROVIDE CONTINGENCY ALLOWANCE FOR CONSERVATION RELEASES
CNST = CONSTANT TO CONVERT AVERAGE KILOWATTS FOR PERIOD TO THOUSAND KILOWATT HOURS
CNSTI = CONSTANT WHICH, WHEN POSITIVE, CONVERTS INFLOW RATE UNITS TO CFS (CMS) AND, WHEN NEGATIVE, CONVERTS (WITHOUT NEGATIVE SIGN) INFLO VOLUME UNITS TO ACRE-FEET (THOUSAND CUBIC METERS)
CNSTO = CONSTANT SIMILAR TO CNSTI BUT APPLIED TO ALL FLOW REQUIREMENTS
CNTRL(I,M) = LEVEL OF RESERVOIR STORAGE AT END OF COMPUTATION INTERVAL I AT LOCATION M
CONST = CONVERSION CONSTANT TO CONVERT FLOW RATE TO VOLUME PER DAY
CPT(M,K) = CONTROL POINT NAME AT LOCATION M
CPWR = CONSTANT TO CONVERT CFS-FEET OR CMS-METERS TO THOUSAND KILOWATT HOURS
CQOEL(IP,K) = TABLE VALUE OF STORAGE OR OUTFLOW AS INDEX OF PEAK POWER CAPACIT AT PLANT IP
CQS = CONSTANT TO CONVERT CFS TO ACRE-FEET (CMS TO THOUSAND CUBIC METERS) FOR INTERVAL
CSQ = CONSTANT TO CONVERT ACRE-FEET TO CFS (THOUSAND CUBIC METERS TO CMS) FOR INTERVAL
CSTI(I) = CONSTANT TO CONVERT INFLOWS TO CFS (CMS) FOR INTERVAL I
CSTO(I) = CONSTANT TO CONVERT WATER REQUIREMENTS TO CFS (CMS) FOR INTERVAL I
CT = CONSTANT TO CONVERT RATE FOR INTERVAL TO AVERAGE ANNUAL RATE FOR SAME VOLUME
CTX = COEFFICIENT TO CONVERT POWER UNITS
DINDX(ID) = SHORTAGE INDEX FOR A DIVERSION ID, SUM OF SQUARES OF ANNUAL SHORTAGES FOR 100 YEARS, EACH SHORTAGE BEING EXPRESSED AS A RATI OF THE ANNUAL REQUIREMENT
ECVAL(I,M,L) = ECONOMIC VALUE IN TABLE FOR STATION M, INTERVAL I AND FUNCTION L
EFCY(M,K) = TABLE VALUE OF POWER PLANT EFFICIENCY VS, STORAGE AT LOCATION M
EFFCY = POWER PLANT EFFICIENCY , INCLUDING TURBINE LOSSES, FOR ALL PLANT
EFY(IP) = INTERPOLATED VALUE OF POWER PLANT EFFICIENCY AT IP
EL(M,K) = TABLE VALUE OF WATER SURFACE ELEVATION FOR RESERVOIR M
ELEV(I,M) = RESERVOIR WATER-SURFACE ELEVATION FOR LOCATION M AT END OF PERIO I
EVAPO(I) = EVAPORATION IN INCHES (MM) FOR INTERVAL I USED AS REFERENCE FOR ALL RESERVOIRS
EVP(I,M) = EVAPORATION IN ACRE-FEET (THOUSAND CUBIC METERS) FOR PERIOD I AN RESERVOIR M
EVPO = EVAPO EXPRESSED IN FEET (METERS)
EVTMP(M) = EVAPORATION IN STORAGE UNITS AT RESERVOIR M



EXHIBIT 2

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FACTR          = FACTOR BY WHICH STORL WILL BE MULTIPLIED
FLWU           = DEFAULT NAME OF FLOW UNIT(CFS)
HEAD(IP)       = HEAD IN FEET (METERS) ON POWER TURBINE AT IP
HYVAL(I,M,L)= HYDROLOGIC VALUE IN TABLE FOR STA M, INTERVAL I AND FUNCTION L
I              = INDEX FOR COMPUTATION INTERVAL
I1             = IRG(1)
I2             = IRG(2)
I3             = IRG(3)
I4             = IRG(4)
I5             = IRG(5)
I6             = IRG(6)
I7             = IRG(7)
I8             = IRG(8)
I9             = IRG(9)
I10            = IRG(10)
IB             = TEMPORARY INDICATOR
IBLK           = HOLLERITH CODE FOR BLANKS
IBR            = ARRAY FOR STORING SEQUENCE OF CARDS READ
IBRN           = EQUATED TO IBR TO BE USED IN A 'COMPUTED GO TO' STATEMENT
ICD            = VARIABLE USED TO READ THE CARD IDENTIFICATION
ICND           = INDICATOR, WHEN ZERO THE ITEM BEING READ OFF THE SCRATCH FILE
                 IS THE FIRST ITEM TO BE REARRANGED
ICONS          = POSITIVE VALUE GIVES PRIORITY OF CONSERVATION RELEASE OVER FLOOD
                 CONTROL REQUIREMENTS
ICPT(M)        = CONTROL POINT NUMBER
ICRD           = ARRAY FOR READING CARDS IN ALPHAMERIC FORMAT
ICSE(I,M)      = IDENTIFICATION OF CONTROLLING ITEM FOR RELEASE AT RESERVOIR M
                 DURING PERIOD I.  PORTION OF NUMBER BEFORE LAST 2 DIGITS IS
                 CONTROLLING LOCATION NUMBER AND LAST 2 DIGITS SHOW CONTROL AS
                 FOLLOWS# 1. MINIMUM FLOW REQUIREMENT 2. POWER REQUIREMENT
                 3. FLOOD CONTROL RELEASE
ID             = IDENTIFICATION NUMBER FOR DIVERSION (READ ORDER NUMBER)
IDBAS(ID)      = STATION USED AS BASE FOR RETURN FLOW COMPUTATION
IDGST          = INDICATOR, POSITIVE VALUE CALLS FOR DIAGNOSTIC PRINTOUT
IDN            = COUNTER FOR TAPE READ RECORDS
IDIV(M)        = SAME AS ID FOR DIVERSION LOCATED AT POINT M
IDIVR(M,K)     = SAME AS ID FOR DIVERSIONS LOCATED IN THE AREA TRIBUTARY ABOVE
                 CONTROL POINT M AND BELOW ALL UPSTREAM RESERVOIRS, INCLUDING ANY
                 DIVERSION AT M THAT TAKES OUT DIRECTLY FROM THE RESERVOIR
                 (IF ANY), BYPASSING THE POWER PLANT(IF ANY)
IDPR(IP)       = IDENTIFICATION NUMBER OF DOWNSTREAM RESERVOIRS THAT CONTROLS
                 TAILWATER ELEVATION AT IP
IDT            = THE LAST TWO DIGITS OF THE YEAR ON CARDS IN=YQ
IDV(ID)        = CONTROL POINT LOCATION NUMBER FOR DIVERSION ID
IDVPR          = INDICATOR, WHEN NEGATIVE PREVENTS BUFFER STORAGE USE FOR
                 DIVERSIONS
IDVSP          = INDICATOR, POSITIVE VALUE CAUSES FLOW IN EXCESS OF CHANNEL
                 CAPACITY TO ENTER DIVERSION
IE(J,M)        = INDICATOR WHEN POSITIVE CALLS FOR ECONOMIC EVALUATION FOR
                 FUNCTION J AT STATION M
IECON          = INDICATOR, POSITIVE VALUE CALLS FOR ECONOMICS COMPUTATION
IEV(M)         = INDICATOR, POSITIVE VALUE CALLS FOR READING DIFFERENT EVAPORATIO
                 PATTERN FOR RESERVOIR M
IEVYR          = INDICATOR, POSITIVE VALUE CALLS FOR READING DIFFERENT EVAPORATIO
                 PATTERN EACH YEAR
IFC            = INDICATOR WHEN POSITIVE THAT OPERATION IS FOR FLOOD CONTROL
IFLOW          = CONTROL POINT NUMBER FOR YIELD OPTIMIZATION
IFMT(N)        = FORMAT CODING SPECIFIED IN SUBROUTINE REARNG
IKODE          = ARRAY CONTAINING IDENTIFICATION CODES FOR ALL CARDS THAT COULD
                 BE READ IN THE CONTROL POINT LOOP
ILST           = INDICATOR WHICH DETERMINES THE LAST CARD WHERE TWO OR MORE CARDS
                 ARE REQUIRED TO COMPLETE READING AN ITEM
IND(I)         = INDICATOR FOR VARIABLES TO BE REARRANGED
INUM           = ALPHAMERIC CODE FOR NUMBERS 1 TO 9
IONE           = VARIABLE FORMAT USED IN REARRANGING OUTPUT
IOPER(IR)      = INDICATOR WHEN NEGATIVE THAT RESERVOIR IR IS NOT OPERATING
                 SPECIFICALLY FOR THE PARTICULAR CONTROL POINT
IP             = IDENTIFICATION NUMBER FOR POWER PLANT (READ ORDER NUMBER)
IPER(I)        = IDENTIFICATION NUMBER OF INTERVAL I
IPERA          = IDENTIFICATION NUMBER OF FIRST INTERVAL OF YEAR
IPNT           = POSITIVE VALUE CAUSES PRINTOUT
IPOW(M)        = INDICATOR, POSITIVE VALUE CALLS FOR PEAKING CAPACITY AS A
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                FUNCTION OF OUTFLOW (RUN-OF-RIVER PLANT) AT M
IPR(IP)         = CONTROL POINT LOCATION NUMBER FOR POWER PLANT IP
IPRL            = INDICATOR, POSITIVE VALUE CALLS FOR PRINTING STORAGE LEVELS WITH
                  RESERVOIR OPERATION DATA EACH YEAR
IPRN(M)         = INDICATOR, NEGATIVE VALUE SUPPRESSES PRINTOUT FOR LOCATION M
IPRNT           = INDICATOR, NEGATIVE VALUE SUPPRESSES PRINTOUT FOR EACH YEAR
IPWKW           = INDICATOR, POSITIVE VALUE CAUSES POWER TO BE COMPUTED IN KW
                  INSTEAD OF THOUSAND KWH
IPWPR           = INDICATOR, NEGATIVE VALUE PREVENTS POWER DEMAND FROM DRAWING ON
                  BUFFER STORAGE
IPWR(M)         = VALUE OF IP FOR PLANT LOCATED AT POINT M
IPWYR           = INDICATOR, POSITIVE VALUE CALLS FOR DIFFERENT POWER LOAD EACH
                  YEAR
IPX(M)          = POSITIVE VALUE INDICATES THAT RESERVOIR M RELEASE IS CONTROLLED
                  BY SYSTEM POWER REQUIREMENT
IR              = RESERVOIR INDEX NUMBER, RESERVOIR SEQUENCE NUMBER USED FOR PRINT
                  OUT
IRA             = SIMILAR TO IR
IRES(M)         = RESERVOIR IDENTIFICATION NUMBER, EQUAL TO M (EVERY RESERVOIR
                  MUST BE NUMBERED SAME AS CONTROL POINT AT ITS LOCATION)
IRESM(M,K)      = RESERVOIR IDENTIFICATION NUMBER FOR ALL RESERVOIRS UPSTREAM OF
                  LOCATION M, INCLUDING RESERVOIR AT M, IF ANY, WITH NEGATIVE
                  SIGN FOR RESERVOIRS NOT OPERATED SPECIFICALLY FOR CONTROLS AT M
IRESP(K)        = CONTROL POINT NUMBER OF POWER RESERVOIR IN SYSTEM
IRG(1)          = INDICATOR, WHEN POSITIVE, TO REARRANGE UNREGULATED FLOWS
IRG(2)          = INDICATOR, WHEN POSITIVE, TO REARRANGE RIVER FLOWS
IRG(3)          = INDICATOR, WHEN POSITIVE, TO REARRANGE DIVERSIONS
IRG(4)          = INDICATOR, WHEN POSITIVE, TO REARRANGE DIVERSION SHORTAGES
IRG(5)          = INDICATOR, WHEN POSITIVE, TO REARRANGE DESIRED FLOW SHORTAGES
IRG(6)          = INDICATOR, WHEN POSITIVE, TO REARRANGE MINIMUM FLOW SHORTAGES
IRG(7)          = INDICATOR, WHEN POSITIVE, TO REARRANGE END OF PERIOD STORAGES
IRG(8)          = INDICATOR, WHEN POSITIVE, TO REARRANGE CHANGE IN STORAGE AT END
                  OF  PERIOD
IRG(9)          = INDICATOR, WHEN POSITIVE, TO REARRANGE END-OF-PERIOD ELEVATIONS
IRG(10)         = INDICATOR, WHEN POSITIVE, TO REARRANGE RESERVOIR DATA
IRPT            = INDICATOR, WHERE POSITIVE, CALLS FOR REPEATING ONE STORAGE VALUE
                  FOR ALL LEVELS
ISERV(M,K)      = LOCATION NUMBER SERVED BY RESERVOIR M
ISHDV(K)        = DIVERSION NUMBER WHERE SHORTAGE IS DECLARED
ISHG(K)         = LOCATION NUMBER WHERE SHORTAGE IS DECLARED
ISHR(K)         = RESERVOIR NUMBER USED FOR SHORTAGE DECLARATION
ISMRY           = INDICATOR CALLING FOR SUMMARY COMPILATIONS
ISPER           = IDENTIFICATION NUMBER OF FIRST SHORTAGE INTERVAL
ISRCH(M)        = INDICATOR, WHEN POSITIVE , ALLOWS SPILLWAY SURCHARGE
ISTOR(I)        = STORAGE AT END OF INTERVAL I, CONVERTED TO INTEGER FOR PRINTOUT
ISYSR(M)        = POWER SYSTEM IDENTIFICATION
IT              = COUNTER TO COUNT TITLE CARDS OF FOLLOWING JOBS
ITEMP           = TEMPORARY INTEGER VARIABLE
ITMP            = TEMPORARY INTEGER VARIABLE
ITP             = TEMPORARY INTEGER VARIABLE
ITPA            = TEMPORARY INTEGER VARIABLE
ITRNS           = TRANSFER INDICATOR (POSITIVE VALUE CAUSES SKIP OR READ AND OTHER
                  UNNECESSARY REPETITIONS)
ITSRV(K)        = IDENTIFICATION NUMBER OF DOWNSTREAM LOCATION FOR WHICH RESERVOIR
                  DOES NOT PROVIDE SPECIAL RELEASES
ITST            = INDICATOR SPECIFIED IN SUBROUTINE REARNG TO CONTROL PRINT OUT
ITWO            = VARIABLE FORMAT USED IN REARRANGING OUTPUT
IUNIT           = INDICATOR, IF POSITIVE, OUTPUT UNITS ARE NONSTANDARD
IUPDT           = INDICATOR, POSITIVE VALUE CALLS FOR CONTINUING OPERATION STUDY
                  WITH NEW SYSTEM DATA AFTER NYRS
IUPQI(M,K)      = IDENTIFICATION NUMBER OF CONTROL POINT UPSTREAM OF M THAT IS NOT
                  AT OR ABOVE A RESERVOIR OR ANOTHER CONTROL POINT UPSTREAM OF M
IUPST(M,K)      = IDENTIFICATION NUMBER OF RESERVOIRS IMMEDIATELY UPSTREAM OF
                  CONTROL POINT M (ALL RESERVOIRS THAT RELEASE WATER TO M WHICH
                  DOES NOT PASS THROUGH INTERMEDIATE RESERVOIRS)
IX              = INTERVAL NUMBER
IY              = TEMPORARY INDEX
IYEAR           = FIRST YEAR OF OPERATION STUDY
IYR             = YEAR NUMBER
IYR1            = FIRST YEAR OF OPERATION STUDY
IYRA            = YEAR NUMBER
IZERO           = VARIABLE FORMAT USED IN REARRANGING OUTPUT
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| J | = INDEX FOR YEAR |
| JBRN | = INDICATES WHETHER ONE OR ALL OF THE J5 THROUGH J7 CARDS HAVE BEEN READ |
| JFMT | = FORMAT CODING SPECIFIED IN SUBROUTINE REARNG |
| JJ,JK | = TEMPORARY VARIABLES USED TO ARRANGE MONTHS AND NUMBER OF DAYS ACCORDING TO IPERA |
| JL | = NUMBER OF RL CARDS READ |
| JONE | = VARIABLE FORMAT USED IN REARRANGING OUTPUT |
| JPRNT | = PRINT CONTROL INDICATOR, NEGATIVE VALUE SUPPRESSES PRINTOUT |
| JTMP | = TEMPORARY VARIABLE |
| JTWO | = VARIABLE FORMAT USED IN REARRANGING OUTPUT |
| JUPQI | = INDICATOR, IF POSITIVE CALLS FOR SPECIFYING LOCAL INFLOWS AS INTERMEDIATE INFLOWS BETWEEN CONTROL POINTS, IF ZERO OR NEGATIV , LOCAL INFLOWS ARE FOR AREAS BELOW UPSTREAM RESERVOIRS |
| JZERO | = VARIABLE FORMAT USED IN REARRANGING OUTPUT |
| K | = INDEX FOR TABLE VALUES, CONTROL POINT SEQUENCE NUMBER USED FOR PRINT OUT |
| KA | = TEMPORARY INDEX |
| KCPT | = LARGEST ACCEPTABLE (DIMENSION) NUMBER OF CONTROL POINTS, ALL OF WHICH MUST BE NUMBERED BY INTEGERS KCPT OR SMALLER |
| KDAY | = ARRAY CONTAINING DEFAULT VALUES FOR NUMBER OF DAYS IN A PERIOD |
| KDIV | = DIMENSION LIMIT OF DIVERSIONS |
| KDT | = CONTAINS THE VALUE OF IDT PRIOR TO ITS LAST CHANGE |
| KFMT | = FORMAT CODING SPECIFIED IN SUBROUTINE REARNG |
| KJ | = TEMPORARY INDEX |
| KL | = DIMENSION LIMIT OF STORAGE LEVELS |
| KODE | = IDENTIFICATION CODES FOR CARDS THAT COULD BE READ IN THE YEAR LOOP |
| KONE | = VARIABLE FORMAT USED IN REARRANGING OUTPUT |
| KPER | = DIMENSION LIMIT OF PERIODS PER YEAR |
| KPWR | = DIMENSION LIMIT OF POWER PLANTS |
| KPWRS | = LIMIT OF NUMBER OF POWER SYSTEMS |
| KQIL | = DIMENSION LIMIT TOTAL NUMBER OF STATION REFERENCES FOR COMPUTING LOCAL INFLOWS |
| KRES | = LARGEST ACCEPTABLE (DIMENSION) NUMBER OF RESERVOIRS, ALL OF WHICH MUST BE NUMBERED BY INTEGERS KRES AND SMALLER AND BE IDENTICAL TO CONTROL POINT IDENTIFICATION NUMBER FOR THE SAME LOCATION |
| KSERV | = DIMENSION LIMIT OF LOCATIONS SERVED BY ANY ONE RESERVOIR |
| KTWO | = VARIABLE FORMAT USED IN REARRANGING OUTPUT |
| KUPQI | = DIMENSION LIMIT OF NON-RESERVOIR CONTROL POINTS DIRECTLY UPSTREAM (WITHOUT INTERMEDIATE CONTROL POINTS) OF ANY CONTROL POINT |
| KUPST | = DIMENSION LIMIT FOR NUMBER OF RESERVOIRS (NUPST) DIRECTLY UPSTREAM OF ANY CONTROL POINT |
| KX | = TEMPORARY INDEX |
| KZERO | = VARIABLE FORMAT USED IN REARRANGING OUTPUT |
| L | = INDEX FOR RESERVOIR LEVELS USED FOR COORDINATING RELEASES |
| LA | = TEMPORARY INDEX |
| LCNS | = MAXIMUM STORAGE LEVEL WHERE CONSERVATION DEMANDS ARE GIVEN PRIORITY OVER FLOOD CONTROL |
| LMT | = DIMENSION LIMIT USED IN THE ARGUMENT OF SUBROUTINE BINTP |
| LSV | = INDICATES AT WHAT LEVEL AN RL CARD WAS OMITTED |
| LTRC | = ALPHAMERIC CODE FOR THE LETTER C |
| LTRJ | = ALPHAMERIC CODE FOR THE LETTER J |
| LX | = TEMPORARY INDEX |
| M | = CONTROL POINT IDENTIFICATION NUMBER |
| MDIV | = INDICATOR, WHEN POSITIVE INDICATES THAT A DIVERSION EXISTS AT TH CONTROL POINT |
| MDNST | = NEXT DOWNSTREAM CONTROL POINT |
| MFTRC | = POSITIVE VALUE CALLS FOR METRIC UNITS |
| MPSYS | = NUMBER OF POWER SYSTEMS THAT THE PLANT IS IN |
| MPWR | = INDICATOR, WHEN POSITIVE INDICATES THAT A POWER PLANT EXISTS AT THIS LOCATION |
| MQ(M) | = IDENTIFICATION NUMBER OF INPUT FLOW LOCATION |
| MRES | = INDICATOR, WHEN POSITIVE INDICATES THAT A RESERVOIR EXISTS AT THIS LOCATION |
| MTH | = MONTH OF BENEFIT FUNCTION |
| MX | = CONTROL POINT INDEX |
| N | = TEMPORARY VARIABLE |
| NC | = INDEX EQUAL TO ZERO DURING FIRST APPROXIMATION AND ONE DURING FINAL COMPUTATION FOR EACH INTERVAL |

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NCPT          = NUMBER OF CONTROL POINTS USED IN SYSTEM
NCYCL         = NUMBER OF COMPUTATION CYCLES REQUIRED
NDAYS(I)      = NUMBER OF DAYS IN INTERVAL I
NDIV          = NUMBER OF DIVERSIONS IN SYSTEM
NDIVR(M)      = NUMBER OF DIVERSIONS LOCATED IN THE AREA TRIBUTARY ABOVE CONTROL
                POINT M AND BELOW ALL UPSTREAM RESERVOIRS, INCLUDING ANY
                DIVERSION AT M THAT IS CONSIDERED TO BE TAKEN DIRECTLY FROM THE
                RESERVOIR(IF ANY), BYPASSING POWER PLANT(IF ANY)
NDVSH(ID)     = TOTAL NUMBER OF MONTHLY SHORTAGES AT DIVERSION ID
NDVYR         = NUMBER OF DIVERSIONS FOR WHICH REQUIREMENTS ARE TO BE SPECIFIED
                ANNUALLY
NE            = NUMBER OF BENEFIT FUNCTIONS
NEA           = NUMBER OF BENEFIT FUNCTIONS
NEW           = INDICATOR FOR STARTING ANOTHER JOB
NFL           = NUMBER OF LOWEST FLOOD CONTROL LEVEL
NFLOW         = TOTAL NUMBER OF INPUT INFLOW LOCATIONS
NFLW(M)       = NUMBER OF INFLOW LOCATIONS USED TO COMPUTE LOCAL INFLOW AT M
NFMT          = VARIABLE FORMAT USED IN REARRANGING OUTPUT
NL            = NUMBER OF RESERVOIR STORAGE LEVELS
NLF           = NUMBER OF FLOOD CONTROL LEVELS (NORMALLY 2, AT LEAST 2)
NLYR          = NUMBER OF LEVELS AT DIFFERENT RESERVOIRS THAT ARE TO BE
                SPECIFIED ANNUALLY
NPER          = NUMBER OF PERIODS PER YEAR
NPWR          = TOTAL NUMBER OF POWER PLANTS IN SYSTEM
NPWRS         = NUMBER OF POWER SYSTEMS
NQYR          = NUMBER OF LOCATIONS FOR WHICH FLOW REQUIREMENTS ARE TO BE
                SPECIFIED EACH YEAR
NR            = TEMPORARY VALUE OF NUPST
NRES          = TOTAL NUMBER OF RESERVOIRS IN SYSTEM
NRESM         = NUMBER OF RESERVOIRS AT AND UPSTREAM OF A CONTROL POINT
NRESP(IX)     = NUMBER OF RESERVOIRS IN POWER SYSTEM
NRESR(M)      = NUMBER OF RESERVOIRS AT AND UPSTREAM OF LOCATION M
NSERV(M)      = NUMBER OF LOCATIONS SERVED BY RESERVOIR M
NSHDV         = NUMBER OF DIVERSIONS WHERE SHORTAGES CAN BE DECLARED
NSHMN(M)      = NUMBER OF DESIRED-FLOW SHORTAGES AT LOCATION M
NSHP(M)       = NUMBER OF POWER PLANT SHORTAGES AT LOCATION M
NSHPS(IX)     = NUMBER OF POWER SHORTAGES IN SYSTEM IX
NSHQ          = NUMBER OF CONTROL POINTS WHERE SHORTAGES CAN BE DECLARED
NSHR          = NUMBER OF RESERVOIRS USED IN SHORTAGE DECLARATION
NSH2(M)       = NUMBER OF MINIMUM FLOW SHORTAGES AT LOCATION M
NSPER         = NUMBER OF PERIODS OF DECLARED SHORTAGE
NSRTP(IX)     = NUMBER OF POWER SHORTAGES FOR SYSTEM IX
NSTOR(I,M,K)= NUMBER OF TIMES STORAGE IS IN RANGE K AT LOCATION M DURING
                INTERVAL I
NTAB          = NUMBER OF TABULATED ITEMS IN RESERVOIR TABLES
NTSRV         = NUMBER OF DOWNSTREAM LOCATIONS FOR WHICH RESERVOIR DOES NOT
                PROVIDE SPECIAL RELEASES
NUPQI(M)      = NUMBER OF CONTROL POINTS UPSTREAM OF M AND NOT AT OR ABOVE A
                RESERVOIR OR ANOTHER CONTROL POINT UPSTREAM OF M
NUPST(M)      = NUMBER OF RESERVOIRS IMMEDIATELY UPSTREAM OF CONTROL POINT M
                (ALL RESERVOIRS THAT RELEASE WATER TO M WHICH DOES NOT PASS
                THROUGH INTERMEDIATE RESERVOIRS), EXCLUDING ANY RESERVOIR AT M
NX            = TEMPORARY SUBSCRIPT
NYRS          = NUMBER OF YEARS OF ROUTING
OVLOD(IP)     = COEFFICIENT (GREATER THAN 1) OF POWER PLANT IP NAME-PLATE
                CAPACITY REPRESENTING MAXIMUM PLANT CAPABILITY UNDER OVERLOAD
                CONDITIONS
PFMAX(IX)     = MAXIMUM POWER FACTOR FOR SYSTEM IX
PG(M,L,IX)    = POWER GENERATED AT LOCATION M FOR SYSTEM IX TO REACH LEVEL L
PGAU(K)       = POWER GENERATED AND USABLE AT LOCATION K
PGAUT         = TOTAL POWER GENERATED AND USABLE
PGT(L)        = TOTAL POWER GENERATED TO REACH LEVEL L AT ALL RESERVOIRS IN
                SYSTEM
PINDX(IP)     = SUM OF SQUARES OF ANNUAL POWER SHORTAGES AT IP FOR 100-YEAR
                PERIOD, EACH SHORTAGE EXPRESSED AS RATIO OF REQUIRED POWER FOR
                YEAR
PKPWR(IP,K)   = PEAK POWER IN TABLE FOR IP
POWER(I,IP)   = POWER IN THOUSAND KWH GENERATED AT PLANT IP DURING INTERVAL I
POWR(I,IP)    = POWER REQUIREMENT IN THOUSAND KWH AT PLANT IP DURING INTERVAL I
POWRP(I,IP)   = PEAK POWER CAPACITY AT PLANT IP DURING INTERVAL I
POWRT         = TOTAL POWER REQUIREMENT
PUNIT         = NAME OF POWER UNITS (KILOWATTS OR THOUSAND KWH)
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PWER(I,IP) = ADJUSTED POWER REQUIREMENT AT PLANT IP DURING INTERVAL I
PWERT = TOTAL REQUIRED POWER
PWRMX(IP) = NAME-PLATE GENERATING CAPACITY IN KILOWATTS AT PLANT IP
PWRS(I,IX) = SYSTEM IX POWER REQUIREMENT DURING INTERVAL I
Q(I) = FLOW IN BENEFITS TABLE
QA(I,M) = ACTUAL AVERAGE FLOW IN CFS (CMS) AT POINT M DURING INTERVAL I, EXCLUDING ANY DIVERSION AT M
QASUM = SUM OF RELEASES IN CFS (CMS) AT ALL RESERVOIRS IMMEDIATELY UPSTREAM OF M (THOSE MAKING RELEASES TO M WHICH DO NOT PASS THROUGH INTERMEDIATE RESERVOIRS), EXCLUDING RELEASE AT M
QAX = TOTAL RELEASE AT RESERVOIRS IMMEDIATELY UPSTREAM
QCAP(M,K) = TABLE VALUE OF OUTLET CAPACITY FOR RESERVOIR M
QCONS(I,M) = CONSERVATION RELEASE AT M DURING INTERVAL I
QCX = TOTAL CONSERVATION RELEASE AT RESERVOIRS IMMEDIATELY UPSTREAM
QDIV(I,ID) = REQUIRED DIVERSION IN CFS (CMS) AT ID DURING INTERVAL I
QDIVA(I,ID) = ACTUAL DIVERSION IN CFS (CMS) AT ID DURING INTERVAL I
QDIVR(M) = TOTAL DIVERSION IN CFS (CMS) DURING A GIVEN INTERVAL IN AREA TRIBUTARY ABOVE M AND BELOW ALL UPSTREAM RESERVOIRS INCLUDING ANY DIVERSION AT M
QDIVS(I,ID) = DIVERSION REQUIREMENT AT ID DURING INTERVAL I AS MODIFIED BY ANY DECLARED SHORTAGE
QDV = REQUIRED DIVERSION IN CFS(CMS) AT GIVEN LOCATION
QI(I,M) = INFLOW IN CFS (CMS) TO M DURING INTERVAL I
QII(I,M) = INPUT INFLOW FOR PERIOD I AT STATION M (NOT NECESSARILY CONTROL POINT M)
QINDX(M) = SUM OF SQUARES FOR 100-YEAR PERIOD OF ANNUAL SHORTAGES IN MINIMUM DESIRED FLOW AT M, EACH SHORTAGE EXPRESSED AS A RATIO TO TOTAL ANNUAL DESIRED FLOW
QL(I,M) = LOCAL INFLOW TO M FROM AREA TRIBUTARY BELOW ALL UPSTREAM RESERVOIRS DURING INTERVAL I
QLKG(M) = LEAKAGE AT RESERVOIR M (CFS OR CMS)
QMAXA(M) = OUTLET CAPACITY IN CFS (CMS) AT RESERVOIR M
QMIN(I,M) = MINIMUM DESIRED FLOW AT M DURING INTERVAL I
QMINA(I,M) = MINIMUM DESIRED FLOW IN CFS(CMS) AT LOCATION M DURING INTERVAL I
QMINS(I,M) = MINIMUM DESIRED FLOW AT M DURING INTERVAL I AS MODIFIED BY ANY DECLARED SHORTAGE
QMIN2(I,M) = MINIMUM REQUIRED FLOW AT LOCATION M DURING INTERVAL I, SHORTAGES OCCUR ONLY WHEN ALL ACTIVE STORAGE IS DEPLETED
QMN = MINIMUM DESIRED FLOW AT GIVEN LOCATION
QMX(I,M) = MAXIMUM PERMISSIBLE FLOW AT M FOR INTERVAL I
QMXX = MAXIMUM PERMISSIBLE FLOW (NEGATIVE VALUE CALLS FOR SPECIFYING MAXIMUM FLOW BY MONTH)
QM2(M) = MINIMUM REQUIRED FLOW AT M
QO(M,L) = RELEASE IN CFS (CMS) REQUIRED AT RESERVOIR M TO REACH LEVEL L IF NO RELEASES ARE MADE UPSTREAM
QOMN(M) = MINIMUM RELEASE IN CFS (CMS) AT M, EXCLUDING RELEASES AT UPSTREAM RESERVOIRS, CONSISTENT WITH CONSERVATION RELEASE DETERMINATIONS AT ALL RESERVOIRS
QOMNA(M) = MINIMUM PERMISSIBLE LIMIT OF QOMN(M)
QOMNB(M) = MAXIMUM PERMISSIBLE LIMIT OF QOMN(M)
QOT(M,L) = SUM OF QO VALUES IN A GIVEN INTERVAL FOR ALL RESERVOIRS AT OR ABOVE M CORRESPONDING TO LEVEL L
QOTMN(M) = MINIMUM PERMISSIBLE TOTAL FLOW AT M
QOTMX(M) = MAXIMUM PERMISSIBLE TOTAL FLOW AT M
QPREP(I,M) = UNREGULATED FLOW IN CFS (CMS) AT M DURING INTERVAL I, CONSIDERED AS PREPROJECT FLOW
QT(IP,K) = FLOW IN TAILWATER TABLE FOR PLANT IP
QUNIT = NAME OF FLOW UNITS
Q2NDX(M) = SUM OF SQUARES FOR 100-YEAR PERIOD OF ANNUAL SHORTAGES IN MINIMUM REQUIRED FLOW AT M, EACH SHORTAGE EXPRESSED AS A RATIO TO TOTAL ANNUAL REQUIRED FLOW
RNYRS = RECIPROCAL OF ANYRS
RSHDV = RATIO BY WHICH STORAGE DEFICIENCY MUST BE MULTIPLIED TO OBTAIN DIVERSION SHORTAGE DECLARATION
RSHQ = RATIO BY WHICH STORAGE DEFICIENCY MUST BE MULTIPLIED TO OBTAIN FLOW SHORTAGE DECLARATION
RTIQ(K) = RATIO BY WHICH INFLOW (QII) AT MQ(K) MUST BE MULTIPLIED TO OBTAIN LOCAL INFLOW COMPONENT
RTIQD(ID) = RATIO BY WHICH DIVERSION MUST BE MULTIPLIED TO OBTAIN RETURN FLOW AT ID
SCNS(M) = TOTAL CONSERVATION FLOW FOR YEAR AT LOCATION M
SDV(ID) = AVERAGE ANNUAL REQUIRED DIVERSION IN CFS (CMS) AT ID

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SDVA(ID)     = AVERAGE ANNUAL ACTUAL DIVERSION IN CFS (CMS) AT ID
SEVP(M)      = AVERAGE ANNUAL EVAPORATION IN ACRE-FEET (THOUSAND CUBIC METERS)
               AT M
SHDIV(I,ID)  = SHORTAGE IN CFS (CMS) DURING INTERVAL I AT ID
SHDMX(ID)    = MAXIMUM MONTHLY DIVERSION SHORTAGE (CFS OR CMS) AT ID
SHMX(M)      = MAXIMUM SHORTAGE OF DESIRED FLOW AT M
SHMX2(M)     = MAXIMUM SHORTAGE OF REQUIRED FLOW AT M
SHORT        = AMOUNT OF SHORTAGE IN FIRM YIELD (USED TO OPTIMIZE YIELD)
SHPMX        = MAXIMUM POWER SHORTAGE DURING THE RUN
SHRTA        = ACCUMULATED SHORTAGE IN DESIRED FLOW (FOR OPTIMIZING YIELD)
SHRTP(I,IP)  = SHORTAGE IN KWH DURING INTERVAL I AT IP
SHRTQ(I,M)   = SHORTAGE IN CFS (CMS) OF DESIRED FLOW DURING INTERVAL I AT M
SHRT2(I,M)   = SHORTAGE IN CFS (CMS) OF REQUIRED FLOW DURING INTERVAL I AT M
SM(J)        = SUM OF BENEFITS FOR FUNCTION J
SPMX(IP)     = PEAK POWER FOR PERIOD OF RECORD AT IP
SPR(IP)      = AVERAGE ANNUAL POWER REQUIREMENT IN THOUSAND KWH AT IP
SPRE(M)      = AVERAGE ANNUAL PREPROJECT FLOW IN CFS (CMS) AT M
SPSMX(M)     = MAXIMUM POWER SHORTAGE AT M
SPWR(IP)     = AVERAGE ANNUAL POWER GENERATION IN THOUSAND KWH AT IP
SQ(M)        = AVERAGE ANNUAL DESIRED FLOW IN CFS (CMS) AT M
SQA(M)       = AVERAGE ANNUAL ACTUAL FLOW IN CFS (CMS) AT M
SQI(M)       = AVERAGE ANNUAL INFLOW IN CFS (CMS) AT M
SQL(M)       = AVERAGE ANNUAL LOCAL FLOW IN CFS (CMS) AT M
SQMN(M)      = AVERAGE ANNUAL REQUIRED FLOW IN CFS (CMS) AT M
SRPLS        = ACCUMULATED SURPLUS (SPILL) AS RATIO TO DESIRED FLOW DURING
               CRITICAL PERIOD
SSHD(ID)     = AVERAGE ANNUAL SHORTAGE IN CFS (CMS) AT DIVERSION ID
SSHP(IP)     = AVERAGE ANNUAL SHORTAGE IN THOUSAND KWH AT POWER PLANT IP
SSHQ(M)      = AVERAGE ANNUAL SHORTAGE IN CFS (CMS)OF DESIRED FLOW AT M
SSH2(M)      = AVERAGE ANNUAL SHORTAGE IN CFS (CMS) OF REQUIRED FLOW AT M
SSP(IP)      = AVERAGE ANNUAL SYSTEM POWER GENERATED AT IP
STOR(M,K)    = TABLE VALUES OF STORAGE IN ACRE-FEET (THOUSAND CUBIC METERS) AT
STOR1(M)     = STARTING VALUE OF STORAGE IN ACRE-FEET (1000 CUBIC METERS) AT M
STORA(M)     = STORAGE IN ACRE-FEET (THOUSAND CUBIC METERS) AT M AT START OF A
               GIVEN INTERVAL
STORB(I,M)   = STORAGE IN ACRE-FEET (THOUSAND CUBIC METERS) AT M AT END OF
               INTERVAL I
STORL(I,M,L) = TABLE VALUE OF STORAGE IN ACRE-FEET (THOUSAND CUBIC METERS) AT M
               CORRESPONDING TO LEVEL L AT END OF INTERVAL I
STRAV(M)     = AVERAGE STORAGE IN ACRE-FEET (THOUSAND CUBIC METERS) FOR A GIVEN
               INTERVAL AT M
STRSH        = AGGREGATE STORAGE BELOW WHICH SHORTAGE IS DECLARED
SUM          = SUM OF VARIOUS QUANTITIES
SUMA         = SUM OF BENEFITS
SYCNS(M)     = TOTAL CONSERVATION FLOW FOR YEAR AT M
SYDV(ID)     = AVERAGE REQUIRED DIVERSION IN CFS (CMS) AT ID DURING YEAR
SYDVA(ID)    = AVERAGE ACTUAL DIVERSION IN CFS (CMS) AT ID DURING YEAR
SYDYS        = TOTAL NUMBER OF DAYS IN ALL INTERVALS FOR A YEAR
SYEVP(M)     = TOTAL EVAPORATION IN ACRE-FEET (THOUSAND CUBIC METERS) AT M FOR
               GIVEN YEAR
SYMSP(IX)    = MAXIMUM POWER SHORTAGE IN SYSTEM IX
SYPMX(IP)    = PEAK POWER FOR YEAR AT IP
SYPR(IP)     = TOTAL REQUIRED POWER IN THOUSAND KWH FOR A GIVEN YEAR AT IP
SYPRE(M)     = AVERAGE PREPROJECT FLOW IN CFS (CMS) AT M FOR A GIVEN YEAR
SYPWR(IP)    = TOTAL GENERATED POWER IN THOUSAND KWH FOR A GIVEN YEAR AT IP
SYQ(M)       = AVERAGE DESIRED FLOW IN CFS (CMS) AT M FOR A GIVEN YEAR
SYQA(M)      = AVERAGE ACTUAL FLOW IN CFS (CMS) AT M FOR A GIVEN YEAR
SYQI(M)      = AVERAGE INFLOW IN CFS (CMS) AT M FOR A GIVEN YEAR
SYQL(M)      = AVERAGE LOCAL FLOW IN CFS (CMS) AT M FOR A GIVEN YEAR
SYQMN(M)     = AVERAGE REQUIRED FLOW IN CFS (CMS) AT M FOR A GIVEN YEAR
SYSHD(ID)    = AVERAGE IN CFS (CMS) OF THE SHORTAGES OF DIVERSION IN ALL
               INTERVALS OF A GIVEN YEAR AT ID
SYSHP(IP)    = TOTAL OF THE SHORTAGES IN THOUSAND KWH IN ALL INTERVALS OF A
               GIVEN YEAR AT POWER PLANT IP, INTERVAL SURPLUSES ARE IGNORED
SYSHQ(M)     = AVERAGE IN CFS (CMS) OF THE SHORTAGES IN DESIRED FLOW AT M FOR
               YEAR
SYSH2(M)     = AVERAGE IN CFS (CMS) OF THE SHORTAGE IN REQUIRED FLOW AT M FOR
               YEAR
SYSP(IP)     = SYSTEM POWER GENERATION FOR YEAR
SYSSP(IP)    = SYSTEM POWER SHORTAGE
SYSYS(IP)    = SYSTEM POWER SHORTAGE FOR YEAR
TAVE         = GRAND AVERAGE FOR ALL CONTROL POINTS
```

```
TEMP          • TEMPORARY VARIABLE
TFLOW         • ACCUMULATED FLOW DURING CRITICAL PERIOD
TITLE(K)      • TITLE OF STUDY
TL(IP,K)      • TAILWATER ELEVATION BELOW IP
TLWEL(IP)     • TAILWATER ELEVATION PLUS HYDRAULIC LOSSES (EXCLUSIVE OF TURBINE
                LOSSES) IN FEET AT POWER PLANT IP
TMP           • TEMPORARY VARIABLE
TMPA          • TEMPORARY VARIABLE
TMPG          • TEMPORARY VARIABLE
TMPP(M)       • POWER RELEASE REQUIREMENT IN CFS (CMS) AT M
TMPPR         • POWER RELEASE REQUIREMENT
TMPR(I)       • MAXIMUM DESIRED FLOW DURING INTERVAL I AT CONTROL POINT WHERE
                YIELD IS BEING OPTIMIZED
TMPRS         • TEMPORARY NAME FOR POWER REQUIREMENT
TMPX(I)       • TEMPORARY VARIABLE FOR INTERVAL I
TP            • TEMPORARY VARIABLE
TPP           • TEMPORARY VARIABLE
TSYP          • AVERAGE SYSTEM POWER GENERATION IN KW FOR YEAR
TWEL(IP)      • TAILWATER ELEVATION BELOW IP
V(J,M)        • TOTAL VALUE OF BENEFITS AT M FOR FUNCTION J
VLEFT(J,M)    • TOTAL VALUE OF BENEFITS REMAINING AT M FOR FUNCTION J
VMAX(J,M)     • MAXIMUM VALUE OF BENEFITS AT M FOR FUNCTION J
VOLU          • DEFAULT NAME OF VOLUME UNIT(AC-FT)
VU(J,M)       • VALUE OF BENEFITS UNALLOCATED AT M FOR FUNCTION J
VUNIT         • NAME OF VOLUME (STORAGE) UNITS
     END
```

# EXHIBIT 3

# INVENTORY OF

# VARIABLE LOCATIONS

The locations within the source deck for all variables are shown in this section. The numbers adjacent to variable names are the statements in which the variable appears. i.e., the number 1400.03 indicates the third statement following statement 1400. An = sign appears after statement numbers for statements in which the variable occurs to the left of an equal sign. An * appears before a library function or subprogram name.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ANDYS | 1400.03= | 1400.04 | 1780.05= | 1780.06 | | | | MAIN |
| ANYR | 1830.02= | 1900.00 | 1900.01 | 1900.02 | 1900.03 | 1900.04 | 1900.05 | MAIN |
| | 1900.06 | 1900.07 | 1900.08 | 2190.00 | 2190.01 | 2190.02 | 2230.01 | MAIN |
| | 2320.02 | 2320.03 | 2320.04 | 2320.05 | 2590.02 | 2590.03 | 2590.04 | MAIN |
| ANYRS | 1830.00= | 1830.01 | 1830.02 | | | | | MAIN |
| APERD | 2110.00 | 2950.04 | | | | | | MAIN |
| APRD | 2110.00 | 2950.04 | | | | | | MAIN |
| CACFT | 1850.01 | 1850.02 | 1850.04 | 1850.05 | 2240.00 | | | MAIN |
| CCFS | 2030.01 | 2030.02 | 2030.03 | 2030.04 | 2030.05 | 2030.06 | 2030.07 | MAIN |
| | 2030.08 | 2030.09 | 2030.13 | 2030.14 | 2030.15 | | | MAIN |
| CFLOW | 1200.01= | 1510.00 | 2640.06 | 2640.07= | 2650.02 | 2650.03= | 2660.00= | MAIN |
| | 2680.02 | | | | | | | MAIN |
| CNTRL | 2470.01 | | | | | | | MAIN |
| *COMP | 1780.02 | | | | | | | MAIN |
| CONST | 1780.06 | | | | | | | MAIN |
| CPT | 2040.03 | 2060.00 | 2710.05 | | | | | MAIN |
| CQS | 1780.06= | 1810.00 | | | | | | MAIN |
| CSOUT | 1660.03 | 1840.00 | 1880.01 | 1880.02 | 1880.03 | 1880.04 | 1880.05 | MAIN |
| | 1880.06 | 1880.08 | 2030.17 | 2190.08 | 2510.03 | 2510.03 | 2530.04 | MAIN |
| | 2530.04 | 2910.03 | 2910.04 | 2930.00 | | | | MAIN |
| CSTI | 1630.04 | 1700.00 | | | | | | MAIN |
| CSTO | 1350.06 | 1470.05 | | | | | | MAIN |
| DINDX | 1120.00= | 2190.03= | 2780.04= | 2780.05 | 2780.05= | 2790.01 | | MAIN |
| ECON | 2980.02 | 2980.02 | | | | | | MAIN |
| EFFCY | 1170.00 | | | | | | | MAIN |
| EFY | 1170.00= | | | | | | | MAIN |
| ELEV | 2290.01 | 2550.09 | 2550.09 | 2550.10 | 2550.10 | | | MAIN |
| EVAPO | 1170.03 | 1280.00 | 1280.01 | 1280.01 | | | | MAIN |
| EVP | 1080.04= | 1310.04 | 1310.05 | 1310.05 | 1850.05= | 2300.01 | 2550.10 | MAIN |
| | 2550.10 | | | | | | | MAIN |
| FACTR | 1530.02 | 1540.01= | 1540.01= | 1580.01 | | | | MAIN |
| I | 1080.03 | 1080.04= | 1140.01= | 1140.02= | 1170.02 | 1170.03 | 1230.02 | MAIN |
| | 1240.01 | 1240.01 | 1250.01 | 1250.01 | 1280.00 | 1280.01 | 1280.01 | MAIN |
| | 1310.04 | 1310.05 | 1310.05 | 1350.02 | 1350.03 | 1350.03 | 1350.05 | MAIN |
| | 1350.06= | 1350.07= | 1390.02 | 1390.03 | 1390.03 | 1400.01 | 1400.02 | MAIN |
| | 1400.03 | 1400.04= | 1430.02 | 1430.03 | 1430.03 | 1470.02 | 1470.03 | MAIN |
| | 1470.03 | 1470.04 | 1470.05= | 1470.06 | 1470.06= | 1500.01 | 1510.00= | MAIN |
| | 1530.02 | 1540.04 | 1540.05= | 1560.01 | 1580.00 | 1580.01= | 1590.01 | MAIN |
| | 1470.03 | 1470.04 | 1470.05= | 1470.06 | 1470.06= | 1500.01 | 1510.00= | MAIN |
| | 1530.02 | 1540.04 | 1540.05= | 1560.01 | 1580.00 | 1580.01= | 1590.01 | MAIN |
| | 1590.01 | 1620.05 | 1630.00= | 1630.03 | 1630.04= | 1630.10= | 1660.01 | MAIN |
| | 1660.02 | 1660.03 | 1660.04 | 1670.01= | 1690.00 | 1700.00= | 1710.03 | MAIN |
| | 1710.04 | 1710.04= | 1710.05= | 1710.05= | 1710.06= | 1710.07= | 1770.00 | MAIN |
| | 1770.00 | 1780.04 | 1780.05 | 1780.14 | 1780.16 | 1780.17 | 1800.01 | MAIN |
| | 1800.03 | 1830.09 | 1830.14 | 1840.00= | 1850.03 | 1850.04= | 1850.05= | MAIN |
| | 1880.00 | 1880.01= | 1880.02= | 1880.03= | 1880.04= | 1880.05= | 1880.06= | MAIN |
| | 1880.08= | 1910.01= | 1920.01= | 1930.00= | 1960.00 | 1960.01 | 1980.00 | MAIN |
| | 1980.01 | 1990.00 | 2000.01 | 2010.02 | 2030.16= | 2030.17= | 2110.00 | MAIN |
| | 2120.01 | 2130.01 | 2150.03 | 2190.05= | 2190.06= | 2190.08= | 2196.01 | MAIN |
| | 2200.01 | 2210.01 | 2230.06 | 2240.00= | 2250.00 | 2270.00 | 2280.00= | MAIN |
| | 2280.01 | 2290.01 | 2300.01 | 2320.10 | 2320.11 | 2320.13= | 2320.14= | MAIN |
| | 2320.15= | 2320.16= | 2330.05 | 2340.01 | 2350.01 | 2360.01 | 2380.01 | MAIN |
| | 2390.02= | 2390.03 | 2400.01 | 2400.02 | 2400.02 | 2430.01 | 2430.02 | MAIN |
| | 2440.02 | 2460.01 | 2470.01 | 2490.02 | 2500.01 | 2510.01 | 2510.02= | MAIN |
| | 2510.03 | 2510.03= | 2515.01 | 2520.01 | 2530.02 | 2530.03= | 2530.04 | MAIN |
| | 2530.04= | 2535.01 | 2540.01 | 2590.06 | 2600.01 | 2610.01 | 2620.01 | MAIN |
| | 2950.04 | 2960.02 | | | | | | MAIN |
| ICPT | 1150.08= | 1310.02 | 1620.02 | 1710.02 | 1830.04 | 2710.03 | 2810.01 | MAIN |
| | 2870.00 | 2880.01 | 2910.02 | 2950.02 | | | | MAIN |
| ICSE | 2460.01 | | | | | | | MAIN |
| ID | 1110.01= | 1110.02= | 1110.03= | 1110.04= | 1110.05= | 1110.06= | 1120.00= | MAIN |
| | 1350.04= | 1350.06= | 1350.07= | 1730.02 | 1730.03= | 1730.04= | 1740.00= | MAIN |
| | 1760.01= | 1760.04= | 1770.00 | 1770.00 | 1840.00= | 2010.00= | 2010.01 | MAIN |
| | 2010.01= | 2010.02 | 2030.10= | 2030.11 | 2030.11= | 2030.12= | 2030.13= | MAIN |
| | 2030.14= | 2030.15= | 2030.17= | 2150.00= | 2150.01 | 2170.00 | 2180.00= | MAIN |
| | 2190.00= | 2190.01= | 2190.02= | 2190.03= | 2190.06 | 2196.01 | 2200.01 | MAIN |
| | 2210.01 | 2710.09= | 2710.10 | 2710.11 | 2720.00= | 2730.00 | 2730.01 | MAIN |
| | 2730.02 | 2780.03 | 2780.04= | 2780.05= | 2780.05= | 2790.01 | 2910.05= | MAIN |
| | 2910.06 | 2930.00= | 2930.01 | | | | | MAIN |
| IDCPT | 1150.05= | | | | | | | MAIN |
| IDIV | 1150.07= | 1350.04 | 2010.00 | 2030.10 | 2150.00 | 2710.09 | 2910.05 | MAIN |
| IDIVF | 1150.03= | | | | | | | MAIN |

```
IDIVR   2090.02                                                                 MAIN
IDSMT   1150.06=                                                                MAIN
IDV     2790.01                                                                 MAIN
IE      1140.02= 1970.01                                                        MAIN
IECON   1830.07  2980.02  2980.02                                              MAIN
IEV     1030.02= 1310.03                                                        MAIN
IEVYR   1270.01                                                                 MAIN
IFLOW   1200.00= 1470.06= 1470.06= 1500.00  1510.00= 1780.03  1780.10          MAIN
        1780.12  1800.01  1800.03  2640.01  2680.02                            MAIN
IKNDE   2980.29                                                                 MAIN
*INOUT  1160.01                                                                 MAIN
IP      1100.02  1100.03= 1100.04= 1100.05= 1100.06= 1100.07= 1110.00=          MAIN
        1160.05  1170.00= 1390.01  1390.02  1390.03  1390.03  1400.02          MAIN
        1400.04= 1750.01  1750.02= 1750.03= 1750.04= 1750.05= 1750.06=          MAIN
        1760.00= 1760.02= 1760.05= 1770.00  1770.00  2000.00= 2000.01          MAIN
        2320.01= 2320.02= 2320.03= 2320.04= 2320.05= 2320.06= 2320.08          MAIN
        2320.09= 2320.13  2320.14= 2320.15= 2320.16= 2330.01  2330.02          MAIN
        2330.03  2330.05  2340.01  2350.01  2360.01  2380.01  2390.01          MAIN
        2390.01  2390.02= 2390.03  2400.01  2400.02  2400.02  2420.00          MAIN
        2420.01  2430.00  2430.02  2430.03  2430.03= 2430.04= 2430.04=          MAIN
        2440.02  2740.03= 2740.05  2740.07  2740.09  2750.00  2750.01          MAIN
        2750.01  2750.02  2750.03  2760.00  2760.01  2820.02  2820.03=          MAIN
        2820.04= 2820.04= 2830.01                                               MAIN
IPNT    1020.01= 1220.02= 1250.01= 1280.01  1300.00  1310.05  1340.01          MAIN
        1350.03  1380.01  1390.03  1420.02  1430.03  1460.01  1470.03          MAIN
        1520.01= 1590.01  1770.00  1820.01  2640.01  2670.00=                  MAIN
IPOW    2430.00  2760.00                                                        MAIN
IPR     1390.03  1390.03  2830.01                                              MAIN
IPRL    2230.03=                                                                MAIN
IPRN    1830.05                                                                 MAIN
IPRNT   1830.05                                                                 MAIN
IPWKW   1760.03  2320.07= 2740.04                                              MAIN
IPWR    2000.00  2320.00= 2320.01  2740.02  2740.03                            MAIN
IPWYR   1380.00                                                                 MAIN
IR      1780.12= 1780.13  1780.14  1780.16  1780.17  1830.12= 1830.13          MAIN
        1830.13= 1830.14                                                        MAIN
IRES    1160.00= 1720.10  1720.10= 1850.00= 2070.00= 2150.01  2230.00          MAIN
        2490.01  2710.10  2740.00  2770.00  2950.03                            MAIN
IRESM   1030.04= 1780.12  1830.12  2040.03                                      MAIN
IRG     2550.02  2550.03  2550.04  2550.05  2550.06  2550.07  2550.08          MAIN
        2550.09  2550.10                                                        MAIN
IRPT    1530.02  1540.02=                                                       MAIN
ISERV   2070.02                                                                 MAIN
ISMRY   2550.01  2980.03                                                        MAIN
ISTOR   2240.00= 2250.00  2280.00= 2280.01                                      MAIN
ISYSR   1150.09= 2390.01  2390.01  2400.02= 2750.01  2750.01                   MAIN
ITEMP   1630.02= 1630.04                                                        MAIN
ITMP    1100.01= 1100.02  1620.04= 1630.01  1680.01  1750.00= 1750.01          MAIN
        1830.06= 1830.08  1830.11  1910.02  1920.00  1950.01  2040.03          MAIN
        2070.01= 2070.02  2090.01= 2090.02                                      MAIN
ITP     1630.06= 1630.07  1630.08  1780.15= 1780.16  1970.01= 1970.02          MAIN
        1970.02= 1970.03                                                        MAIN
ITRNS   1020.00= 1130.01= 2680.00=                                              MAIN
IUNIT   2030.00  2190.07  2510.03  2510.03= 2530.04  2530.04=                  MAIN
IUPDT   2780.01                                                                 MAIN
IUPQI   1630.09                                                                 MAIN
IUPST   1040.02=                                                                MAIN
IX      1120.01= 1120.02= 1130.00= 1350.01  1430.01  1430.02  1430.03          MAIN
        1430.03  1470.01  1530.01= 2560.02  2560.03  2590.01  2590.06          MAIN
        2840.02  2840.03  2850.00                                              MAIN
IYEAR   1160.04=                                                                MAIN
IYR     1160.03  1160.04  1220.02  1220.02  2110.00  2560.00= 2680.01=          MAIN
        2700.00= 2700.01                                                        MAIN
IYR1    1160.03= 2680.01  2700.01                                              MAIN
J       1220.01  1780.02  1830.00                                              MAIN
JPRNT   1830.05= 1900.11= 2150.02  2190.04= 2230.02= 2330.04  2380.00          MAIN
        2440.01  2460.00  2490.00                                              MAIN
JUPQI   1630.05                                                                 MAIN
K       1030.03  1030.04= 1040.01  1040.02= 1050.01  1050.03= 1630.01          MAIN
        1630.02  1630.04  1780.11  1780.12  1830.11  1830.12  1830.14=          MAIN
        1910.00  1920.00  1920.01= 1920.03  1920.04  1920.05= 1930.00=          MAIN
        1950.01  1960.00  1970.00  1970.01  2040.03  2060.00  2070.02          MAIN
```

```
          2090.02  2230.05= 2240.00  2250.00  2710.05  2960.02           MAIN
KCPT      1030.01  1070.00  1140.00                                       MAIN
KDIV      1110.01                                                        MAIN
KJ        1630.08  1630.09                                              MAIN
KPER      1050.01  1080.03                                              MAIN
KPWR      1100.01  1750.00  2590.01  2840.03                            MAIN
KPWRS     1100.01  1120.01  1750.00  2980.19                            MAIN
KRES      1020.05  1030.03  1080.01  1210.04                            MAIN
KUPST     1040.01                                                        MAIN
KWH       2980.21                                                        MAIN
KX        1620.00= 1620.04  1630.01  1680.01=                           MAIN
L         1050.02  1050.03= 1530.02  1540.03  1540.05= 1560.01  1580.01= MAIN
          1590.01  1590.01  2230.04  2230.05                            MAIN
M         1020.05  1030.00= 1030.01  1030.02= 1030.04= 1040.02= 1050.03= MAIN
          1070.00  1070.01= 1070.02= 1070.03= 1070.04= 1070.05= 1070.06= MAIN
          1070.07= 1070.08= 1070.09= 1070.10= 1070.11= 1070.12= 1070.13= MAIN
          1070.14= 1070.15= 1070.16= 1070.17= 1070.18= 1070.19= 1070.20= MAIN
          1080.00= 1080.01  1080.02= 1080.04= 1140.00= 1140.02= 1150.01= MAIN
          1150.02= 1150.03= 1150.04= 1150.05= 1150.06= 1150.07= 1150.08= MAIN
          1150.09= 1150.10= 1150.11= 1160.00= 1210.04  1210.05= 1220.00= MAIN
          1230.02  1240.01  1240.01  1250.01  1250.01  1310.02= 1310.03  MAIN
          1310.04  1310.05  1310.05  1350.02  1350.03  1350.03  1350.04  MAIN
          1470.02  1470.03  1470.03  1470.05= 1470.06  1470.06= 1530.02  MAIN
          1540.03  1540.05= 1560.01  1580.01= 1590.01  1590.01  1620.02= MAIN
          1620.03  1620.04  1630.00= 1630.04= 1630.06  1630.09  1630.10= MAIN
          1660.02  1660.03  1660.04  1670.01= 1700.00= 1710.02= 1710.04  MAIN
          1710.04= 1710.05= 1710.05= 1710.06= 1710.07= 1720.01= 1720.02= MAIN
          1720.03= 1720.04= 1720.05= 1720.06= 1720.07= 1720.08= 1720.09= MAIN
          1720.10  1730.10= 1830.04= 1830.05  1830.06  1830.12  1850.00= MAIN
          1850.01= 1850.02= 1850.04= 1850.05= 1880.01= 1880.02= 1880.03= MAIN
          1880.04= 1880.05= 1880.06= 1880.07= 1880.08= 1900.00= 1900.01= MAIN
          1900.02= 1900.03= 1900.04= 1900.05= 1900.06= 1900.07= 1900.08= MAIN
          1900.09= 1900.10= 1970.01  1980.00  1980.01  1990.00  2000.00  MAIN
          2010.00  2030.01= 2030.02= 2030.03= 2030.04= 2030.05= 2030.06= MAIN
          2030.07= 2030.08= 2030.09= 2030.10  2040.02  2040.03  2060.00  MAIN
          2070.00  2070.01  2070.02  2090.00  2090.01  2090.02  2120.01  MAIN
          2130.01  2150.00  2150.01  2150.03  2230.00  2230.01= 2240.00  MAIN
          2280.00  2290.01  2300.01  2320.00  2320.01  2390.01  2390.01  MAIN
          2400.02= 2460.01  2470.01  2490.01  2490.02  2500.01  2510.02  MAIN
          2515.01  2520.01  2530.01  2530.03  2535.01  2540.01  2710.03= MAIN
          2710.05  2710.07  2710.08  2710.09  2710.10  2710.10  2740.00  MAIN
          2740.01  2740.02  2740.03  2750.01  2750.01  2770.00  2770.00  MAIN
          2770.01  2770.02  2770.03  2770.04  2770.05  2770.06  2810.01= MAIN
          2810.02= 2810.03= 2810.03= 2810.04= 2810.05= 2810.05= 2810.06  MAIN
          2820.00  2870.00  2880.01  2910.02= 2910.03= 2910.04= 2910.05  MAIN
          2910.07  2910.08  2930.01  2930.02  2950.02= 2950.03  2950.04  MAIN
          2960.02                                                        MAIN
MQ        1630.02                                                        MAIN
MX        1230.01  1310.01  1310.02  1620.01  1620.02  1710.01  1710.02  MAIN
          1830.03  1830.04  2590.01= 2590.02= 2590.03= 2590.04= 2590.05= MAIN
          2590.06  2600.01  2610.01  2620.01  2710.02  2710.03  2810.00  MAIN
          2810.01  2810.06= 2820.00= 2840.03= 2840.04= 2850.00  2910.01  MAIN
          2910.02  2950.01  2950.02                                      MAIN
NCPT      1310.01  1620.01  1710.01  1830.03  2710.02  2810.00  2870.00  MAIN
          2880.01  2910.01  2950.01                                      MAIN
NCYCL     1170.01= 1180.01= 1190.01= 1190.02  1190.02=                  MAIN
NDAYS     1400.03  1780.05  2320.11                                      MAIN
NDIV      1730.01  1730.02  2780.02  2780.03  2790.01                   MAIN
NDIVF     1150.04=                                                       MAIN
NDIVR     1150.02= 2090.00  2090.01                                      MAIN
NDVSH     1110.02= 2930.01                                               MAIN
NDVYR     1340.00  1350.01                                              MAIN
NFLOW     1230.01                                                        MAIN
NFLW      1150.11= 1620.03  1620.04                                      MAIN
NL        1780.15  2230.04  2230.05                                      MAIN
NLF       1780.15                                                        MAIN
NLYR      1520.00= 1530.01                                               MAIN
NPER      1170.02  1210.05= 1240.01  1240.01= 1250.01  1250.01  1280.00  MAIN
          1280.01  1280.01  1310.04  1310.05  1310.05  1350.02  1350.03  MAIN
          1350.03  1350.05  1390.02  1390.03  1390.03  1400.01  1430.02  MAIN
          1430.03  1430.03  1470.02  1470.03  1470.03  1470.04  1500.01  MAIN
          1540.04  1560.00  1560.01  1580.00  1590.01  1590.01  1620.05  MAIN
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1630.03 | 1660.01 | 1690.00 | 1710.03 | 1780.04 | 1830.09 | 1850.03 | MAIN |
| | 1880.00 | 1960.00 | 1960.01 | 1980.00 | 1980.01 | 1990.00 | 2000.01 | MAIN |
| | 2010.02 | 2030.16 | 2110.00 | 2120.01 | 2130.01 | 2150.03 | 2190.05 | MAIN |
| | 2196.01 | 2200.01 | 2210.01 | 2230.06 | 2250.00 | 2270.00 | 2280.01 | MAIN |
| | 2290.01 | 2300.01 | 2320.10 | 2330.05 | 2340.01 | 2350.01 | 2360.01 | MAIN |
| | 2380.01 | 2390.02 | 2390.03 | 2400.01 | 2400.02 | 2400.02 | 2430.01 | MAIN |
| | 2440.02 | 2460.01 | 2470.01 | 2490.02 | 2500.01 | 2510.01 | 2515.01 | MAIN |
| | 2520.01 | 2530.02 | 2535.01 | 2540.01 | 2590.06 | 2600.01 | 2610.01 | MAIN |
| | 2620.01 | 2950.04 | | | | | | MAIN |
| NPWR | 1160.05 | 1190.00 | 1390.01 | 2820.01= | 2820.02 | 2830.01 | | MAIN |
| NPWRS | 1190.02 | 1190.02= | 1420.01 | 1430.01 | 2560.01 | 2560.02 | 2840.01 | MAIN |
| | 2840.02 | | | | | | | MAIN |
| NQVR | 1460.00 | 1470.01 | | | | | | MAIN |
| NRESM | 1780.10= | 1780.11 | | | | | | MAIN |
| NRESR | 1150.01= | 1780.10 | 1830.06 | 2040.02 | | | | MAIN |
| NSERV | 2070.01 | | | | | | | MAIN |
| NSH2 | 1070.02= | 2910.07 | 2930.01 | | | | | MAIN |
| NSHMN | 1070.01= | 2910.07 | 2930.01 | | | | | MAIN |
| NSHP | 1070.03= | 2910.08 | 2930.02 | | | | | MAIN |
| NSHPS | 1070.04= | 2910.07 | 2930.02 | | | | | MAIN |
| NSRTP | 1120.02= | 2850.00 | | | | | | MAIN |
| NSTOR | 1050.03= | 2960.02 | | | | | | MAIN |
| NUPQI | 1630.06 | | | | | | | MAIN |
| NX | 1630.09= | 1630.10 | | | | | | MAIN |
| NYRS | 1220.01 | 2950.04 | | | | | | MAIN |
| PINDX | 1110.00= | 2320.06= | 2590.05= | 2820.03= | 2820.04 | 2820.04= | 2830.01 | MAIN |
| | 2840.04= | 2850.00 | | | | | | MAIN |
| POWER | 2000.01 | 2320.15= | 2350.01 | 2390.03 | 2550.10 | 2550.10 | 2610.01 | MAIN |
| POWR | 1390.02 | 1390.03 | 1390.03 | 1400.02 | 1400.04= | 2320.13 | 2380.01 | MAIN |
| POWRP | 2430.02 | 2440.02 | 2550.11 | | | | | MAIN |
| PUNIT | 1770.00 | 1770.00 | | | | | | MAIN |
| PWER | 2320.14= | 2340.01 | 2390.02= | 2600.01 | | | | MAIN |
| PWRMX | 1400.04 | | | | | | | MAIN |
| PWRS | 1430.02 | 1430.03 | 1430.03 | 2590.06 | | | | MAIN |
| Q2NDX | 1070.10= | 1900.10= | 2810.04= | 2810.05 | 2810.05= | 2820.00 | | MAIN |
| QA | 1800.03 | 1830.14 | 1880.05= | 1980.00= | 2500.01 | 2550.03 | 2550.03 | MAIN |
| | 2550.11 | | | | | | | MAIN |
| QCONS | 1880.01= | 2490.02 | | | | | | MAIN |
| QDIV | 1350.06= | 1350.07 | 2190.06 | | | | | MAIN |
| QDIVA | 2010.02 | 2030.17= | 2200.01 | 2550.04 | 2550.04 | | | MAIN |
| QDIVS | 1350.07= | | | | | | | MAIN |
| QI | 1830.14 | 1880.04= | 2150.03 | 2550.10 | 2550.10 | | | MAIN |
| QII | 1230.02 | 1240.01 | 1240.01 | 1250.01 | 1250.01 | 1630.04 | 1700.00 | MAIN |
| | 1920.01= | 1930.00= | 1960.00 | | | | | MAIN |
| QINDX | 1070.09= | 1900.09= | 2810.02= | 2810.03 | 2810.03= | 2810.06 | | MAIN |
| QL | 1630.00= | 1630.04= | 1630.10= | 1660.02 | 1660.03 | 1670.01= | 1700.00= | MAIN |
| | 1880.02= | 2120.01 | | | | | | MAIN |
| QLKG | 1070.20= | 1710.04 | 1710.04= | 2040.03 | | | | MAIN |
| QM2 | 1150.10= | 1880.07= | 2530.01 | 2770.04 | | | | MAIN |
| QMIN | 1470.02 | 1470.03 | 1470.03 | 1470.05= | 1470.06 | 1470.06 | 1510.00= | MAIN |
| | 1710.05= | 1710.05= | 1710.06 | | | | | MAIN |
| QMIN2 | 1710.04 | 1710.04= | 1710.05= | 1710.05= | 2530.03 | | | MAIN |
| QMINA | 1710.06= | 1710.07 | 1800.01 | 1800.03 | 2510.02 | | | MAIN |
| QMINS | 1710.07= | | | | | | | MAIN |
| QPREP | 1880.03= | 1980.01 | 2130.01 | 2550.02 | 2550.02 | | | MAIN |
| QUNIT | 1660.04 | 1770.00 | 1770.00 | | | | | MAIN |
| *REARNG | 2980.06 | | | | | | | MAIN |
| RNYRS | 1830.01= | 1900.00 | 1900.01 | 1900.02 | 1900.03 | 1900.04 | 1900.05 | MAIN |
| | 1900.06 | 1900.07 | 1900.08 | 2190.00 | 2190.01 | 2190.02 | 2230.01 | MAIN |
| | 2320.02 | 2320.03 | 2320.04 | 2320.05 | 2590.02 | 2590.03 | 2590.04 | MAIN |
| | 2780.04 | 2810.02 | 2810.04 | 2820.03 | 2840.04 | | | MAIN |
| RTIO | 1630.04 | | | | | | | MAIN |
| RTIOD | 2780.05 | 2780.05= | | | | | | MAIN |
| SCNS | 1070.15= | 1900.04= | 2770.00 | 2770.00 | | | | MAIN |
| SDV | 1110.06= | 2190.00= | 2730.00 | 2780.05= | 2780.05= | | | MAIN |
| SDVA | 1110.04= | 2190.01= | 2730.01 | | | | | MAIN |
| SEVP | 1080.02= | 2230.01= | 2740.01 | | | | | MAIN |
| SHDIV | 1840.00= | 2210.01 | 2550.05 | 2550.05 | | | | MAIN |
| SHDMX | 1110.03= | 2930.00= | 2930.01 | | | | | MAIN |
| SHMX | 1070.05= | 2910.03= | 2910.07 | 2930.01 | | | | MAIN |
| SHMX2 | 1070.06= | 2910.04= | 2910.07 | 2930.02 | | | | MAIN |
| SHORT | 1210.01= | 1800.07 | 1800.07= | 2640.02 | 2640.02= | 2640.03= | 2640.04= | MAIN |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2640.05= | 2640.05= | 2640.07 | | | | | MAIN |
| SHPMX | 1070.07= | 2910.08 | 2930.02 | | | | | MAIN |
| SHRT2 | 1880.08= | 2540.01 | 2550.07 | 2550.07 | | | | MAIN |
| SHRTA | 1790.03= | 1800.05= | 1800.06 | | | | | MAIN |
| SHRTP | 2320.16= | 2360.01 | 2400.01 | 2550.11 | 2620.01 | | | MAIN |
| SHRTQ | 1880.06= | 2520.01 | 2550.06 | 2550.06 | | | | MAIN |
| SPMX | 1100.07= | 2430.04= | 2430.04= | 2760.01 | | | | MAIN |
| SPR | 1100.06= | 2320.02= | 2320.08 | 2590.02= | 2740.05 | 2750.00 | 2820.04= | MAIN |
| | 2820.04= | | | | | | | MAIN |
| SPRE | 1070.12= | 1900.01= | 2710.08 | | | | | MAIN |
| SPSMX | 1070.08= | 2910.08 | 2930.02 | | | | | MAIN |
| SPWR | 1100.03= | 2320.03= | 2590.03= | 2740.07 | 2750.02 | | | MAIN |
| SQ | 1070.19= | 1900.06= | 2770.02 | 2810.03= | 2810.03= | | | MAIN |
| SQA | 1070.16= | 1900.05= | 2770.01 | | | | | MAIN |
| SQI | 1070.13= | 1900.02= | 2710.10 | 2710.10 | | | | MAIN |
| SQL | 1070.11= | 1900.00= | 2710.07 | | | | | MAIN |
| SQMN | 1070.14= | 1900.03= | 2770.05 | 2810.05= | 2810.05= | 2810.06= | 2870.00 | MAIN |
| SRPLS | 1210.02= | 1810.01 | 1810.01= | 2650.00 | 2650.01 | 2650.01= | 2650.03 | MAIN |
| SSH2 | 1070.18= | 1900.08= | 2770.06 | 2820.00= | 2880.01 | | | MAIN |
| SSHD | 1110.05= | 2190.02= | 2730.02 | | | | | MAIN |
| SSHP | 1100.05= | 2320.04= | 2590.04= | 2740.09 | 2750.03 | | | MAIN |
| SSHQ | 1070.17= | 1900.07= | 2770.03 | | | | | MAIN |
| SSP | 1100.04= | 2320.05= | 2750.01 | 2750.01 | | | | MAIN |
| STOR1 | 1030.00= | 1210.05 | 1220.00 | 1850.01= | 2550.08 | 2550.08 | | MAIN |
| STORA | 1220.00= | | | | | | | MAIN |
| STORB | 1210.05= | 1780.14 | 1850.04= | 1990.00 | 2280.00 | 2550.08 | 2550.08 | MAIN |
| | 2550.10 | 2550.10 | | | | | | MAIN |
| STORL | 1530.02 | 1540.03 | 1540.05= | 1560.01 | 1580.01= | 1590.01 | 1590.01 | MAIN |
| | 1780.16 | 1780.17 | 2240.00 | | | | | MAIN |
| SUM | 1830.10= | 1910.00= | 1910.01 | 1920.02= | 1920.03= | 1920.04= | 1930.00 | MAIN |
| | 2980.35 | | | | | | | MAIN |
| SYCNS | 1720.05= | 1900.04 | 2030.05= | 2490.02 | | | | MAIN |
| SYDV | 1730.03= | 2030.13= | 2190.00 | 2190.03 | 2196.01 | | | MAIN |
| SYDVA | 1730.04= | 2030.14= | 2190.01 | 2200.01 | 2550.04 | 2550.04 | | MAIN |
| SYDYS | 2320.08 | 2320.09 | 2330.01 | 2330.02 | 2330.03 | 2740.05 | 2740.07 | MAIN |
| | 2740.09 | | | | | | | MAIN |
| SYEVP | 1720.10 | 1720.10= | 1850.02= | 2230.01 | 2300.01 | 2550.10 | 2550.10 | MAIN |
| SYMSP | 1130.00= | 2850.00 | | | | | | MAIN |
| SYPMX | 1750.05= | 2430.03 | 2430.03= | 2440.02 | 2550.11 | | | MAIN |
| SYPR | 1750.04= | 2320.02 | 2320.06 | 2320.09= | 2330.09 | 2380.01 | 2590.02 | MAIN |
| | 2590.05 | 2590.06 | | | | | | MAIN |
| SYPRE | 1720.02= | 1900.01 | 2030.02= | 2130.01 | 2550.02 | 2550.02 | | MAIN |
| SYPWR | 1750.02= | 2320.03 | 2330.02 | 2390.03 | 2420.00 | 2550.10 | 2550.10 | MAIN |
| | 2590.03 | 2610.01 | | | | | | MAIN |
| SYQ | 1720.09= | 1900.06 | 1900.09 | 2030.06= | 2515.01 | | | MAIN |
| SYQA | 1720.06= | 1900.05 | 2030.04= | 2500.01 | 2550.03 | 2550.03 | 2550.11 | MAIN |
| SYQI | 1720.03= | 1900.02 | 2030.03= | 2150.03 | 2550.10 | 2550.10 | | MAIN |
| SYQL | 1720.01= | 1900.00 | 2030.01= | 2120.01 | | | | MAIN |
| SYQMN | 1720.04= | 1900.03 | 1900.10 | 2030.08= | 2535.01 | | | MAIN |
| SYSH2 | 1720.08= | 1900.08 | 1900.10 | 2030.09= | 2540.01 | 2550.07 | 2550.07 | MAIN |
| SYSHD | 1740.00= | 2030.15= | 2190.02 | 2190.03 | 2210.01 | 2550.05 | 2550.05 | MAIN |
| SYSHP | 1760.00= | 2320.04 | 2320.06 | 2330.01 | 2400.01 | 2420.01 | 2550.11 | MAIN |
| | 2590.04 | 2590.05 | 2620.01 | | | | | MAIN |
| SYSHQ | 1720.07= | 1900.07 | 1900.09 | 2030.07= | 2520.01 | 2550.06 | 2550.06 | MAIN |
| SYSP | 1750.03= | 2320.05 | 2330.03 | 2390.01 | 2390.01 | 2600.01 | | MAIN |
| SYSSP | 2400.02 | 2400.02 | | | | | | MAIN |
| SYSYS | 1750.06= | 2400.02 | 2400.02 | | | | | MAIN |
| TEMP | 1540.03= | 1540.05 | 1660.03= | 1660.04 | 1780.07= | 1780.14= | 1790.01 | MAIN |
| | 1810.00 | 2320.08= | 2330.01= | 2360.01 | 2420.01= | 2740.05= | 2740.06 | MAIN |
| | 2740.07= | 2740.08 | 2740.09= | 2740.10 | | | | MAIN |
| TFLOW | 1210.03= | 1790.02= | 1800.00 | 1800.01= | 1800.02 | 1800.06 | 1810.00 | MAIN |
| | 2640.02 | 2640.02= | | | | | | MAIN |
| TMP | 1780.08= | 1780.16= | 1790.01 | 1800.03= | 1800.04 | 1800.05 | 1800.06= | MAIN |
| | 1800.07 | 1800.07= | 1810.00= | 1810.01 | 1810.01= | 1910.02= | 1910.03= | MAIN |
| | 1920.01 | 2320.11= | 2320.12= | 2320.13 | 2320.14 | 2320.15 | 2320.16 | MAIN |
| | 2330.02= | 2350.01 | 2420.00= | 2430.02= | 2430.03 | 2430.03= | 2430.04= | MAIN |
| | 2430.04= | | | | | | | MAIN |
| TMPP | 1080.00= | 1350.02 | 1350.05 | 1350.05 | 1350.06 | 1830.14= | 1910.00 | MAIN |
| | 1920.03 | 1920.04 | 1920.05= | 1930.00 | | | | MAIN |
| TMPR | 1470.06 | 1470.06= | 1510.00 | | | | | MAIN |
| TMPX | 1910.01= | 1960.01 | 2190.06= | 2190.08= | 2196.01 | 2320.13= | 2330.05 | MAIN |
| | 2510.02= | 2510.03 | 2510.03= | 2515.01 | 2530.03= | 2530.04 | 2530.04= | MAIN |

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        2535.01                                                                 MAIN
TP      1780.09= 1780.17= 1810.00                                               MAIN
TPP     2640.06= 2640.08  2650.02= 2650.04  2660.00                           MAIN
TSYF    2330.03=                                                                MAIN
TSYP    2340.01                                                                 MAIN
VUNIT   1770.00  1770.00                                                       MAIN
AMOS    3000.22                                                                 INOUT
ANDYS   3430.05= 3440.00  3470.00  3485.03  4630.01= 4630.02                   INOUT
APERO   3000.21= 3290.00  3410.01  4440.03                                     INOUT
APRO    3000.22= 3290.00  3340.04  3340.09  3340.13= 3360.02  3410.01         INOUT
        4440.03                                                                 INOUT
AREA    4000.00  4480.01                                                       INOUT
ATMP    3860.01  4420.03= 4420.04  4420.05                                     INOUT
BLNK    3000.21                                                                 INOUT
CACFT   3000.09= 3200.01  3210.05= 3370.01                                     INOUT
CCFS    3000.07= 3200.00  3210.04= 3370.00  3485.01  3485.02= 3485.03         INOUT
        3490.02  3490.02=                                                      INOUT
CEVAP   3860.01  4430.02                                                       INOUT
CFLOD   3000.02= 3200.00  3210.02= 3210.02= 3370.00                           INOUT
CLOCL   3000.01= 3200.00  3210.01  3210.01= 3370.00                           INOUT
CNSTI   3000.05= 3200.00  3225.00  3230.00= 3370.00  3430.08= 3440.00         INOUT
        3450.00                                                                 INOUT
CNSTO   3000.06= 3200.00  3240.00  3250.00= 3370.00  3460.01= 3470.00         INOUT
        3480.00                                                                 INOUT
CONST   3380.03= 3380.04  3380.04= 3440.00  3470.00  3485.03  3490.02         INOUT
        3490.02                                                                 INOUT
CPT     3720.00  4110.00                                                       INOUT
CQOEL   4090.00  4580.01                                                       INOUT
CSOUT   3000.25= 3485.01= 3485.03=                                             INOUT
CSTI    3430.07= 3440.00= 3450.00=                                             INOUT
CSTO    3460.00= 3470.00= 3480.00= 4270.02  4410.01                           INOUT
DFUNC   3820.03  4290.03                                                       INOUT
DPARA   3820.04  4300.01                                                       INOUT
EFCY    4100.00  4600.01                                                       INOUT
EFFCY   4030.02  4520.02  4600.00                                             INOUT
EL      4020.00  4500.01                                                       INOUT
ELEV    4420.02=                                                               INOUT
EVAPO   3000.24= 3320.00  3500.00  3510.02                                     INOUT
FACTR   3890.02  3900.02  3900.02= 3940.01                                     INOUT
FIRST      .53   3010.07  3020.01=                                             INOUT
FLMT    3220.01                                                                 INOUT
FLWU    3000.08  3210.06                                                       INOUT
I       3000.20  3000.21= 3000.22= 3000.23= 3000.24= 3000.25= 3030.00         INOUT
        3040.00  3110.02  3110.03  3120.01= 3120.04  3120.04= 3130.00         INOUT
        3130.00= 3130.01  3130.02= 3130.02= 3270.00  3290.00  3310.00         INOUT
        3320.00  3330.01  3340.06  3340.08  3340.09  3340.10  3380.06=        INOUT
        3410.01  3420.01  3430.02  3430.03= 3430.04  3430.04= 3430.05         INOUT
        3430.06  3430.07= 3440.00= 3450.00= 3460.00= 3470.00= 3480.00=        INOUT
        3485.01= 3485.03= 3500.00  3510.01  3510.02  3540.00  3630.01         INOUT
        3630.02  3630.03  3630.04  3630.04= 3630.06  3630.07  3660.01         INOUT
        3660.01= 3660.02= 3660.03= 3680.00= 3720.00  3730.02= 3730.03=        INOUT
        3730.04= 3740.00= 3740.05  3740.06= 3760.00  3775.01  3775.03         INOUT
        3775.04  3790.00  3800.00  3810.03  3810.05  3810.05= 3820.03         INOUT
        3820.04  3830.00  3840.00  3850.00  3890.02  3900.05  3900.06=        INOUT
        3920.01  3940.00  3940.01= 3960.03  3960.04= 4050.00= 4260.00         INOUT
        4260.00  4270.01= 4270.02= 4280.00= 4290.03  4300.01  4350.01         INOUT
        4370.01  4390.01  4410.00= 4410.01  4410.02= 4410.03= 4410.04=        INOUT
        4410.05  4410.05= 4440.03  4460.00  4620.01  4620.02  4620.03         INOUT
        4630.01  4630.02= 4730.03= 4730.04  4760.00  4760.03                   INOUT
*IABS   4690.06                                                                 INOUT
IBLK    3660.01  3660.01= 3680.03  4850.00= 4850.00=                           INOUT
IBR        .02   3120.02  3120.05= 3130.01= 3130.02  3130.02= 3160.00         INOUT
        3170.01  3630.06  3710.01                                             INOUT
IBRN    3100.00  3110.03  3120.06  3170.01= 3170.02  3710.01= 3710.04         INOUT
ICD     3100.00  3120.03  3120.06  3160.01  3620.00  3630.02  3640.01         INOUT
        3670.01  3670.04  4720.00  4730.04= 4740.02  4750.00  4760.01         INOUT
ICNT    3010.05= 3110.01= 3120.02  3120.04  3120.04= 3120.05= 3130.00         INOUT
        3130.00= 3130.01= 3130.02  3130.02= 3160.00  3160.04= 3170.00=        INOUT
        3170.01                                                                 INOUT
ICONS   3070.01  3070.02                                                       INOUT
ICPT    3610.07= 4660.02  4690.02                                             INOUT
ICRO       .02   3100.00  3120.06  3140.00= 3620.00  3640.01  3660.00         INOUT
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        3660.01   3660.01=  3670.01   3670.02   3680.03   3755.02   3760.00   INOUT
        3775.03   4130.04   4720.00   4730.01   4740.02   4750.00   4760.01   INOUT
        4800.01   4850.00=  4850.00=                                           INOUT
IDBAS   4240.09=  4240.11                                                     INOUT
IDCPT   3820.00   3820.01   3820.01=  4280.02                                  INOUT
IDGST   3000.15=  3260.00   3370.01                                           INOUT
IDIV    4240.03=  4240.08=                                                    INOUT
IDIVF   3820.00   4280.01=  4280.02                                          INOUT
IDIVR   4240.06=  4330.00                                                     INOUT
IDPR    4030.01   4520.01                                                    INOUT
IDSHT   3820.00   4280.02                                                    INOUT
IDT     4730.01=  4730.02   4730.02   4770.00   4820.00=  4820.00=  4840.00  INOUT
        4840.00=                                                              INOUT
IDV     4240.02=                                                            INOUT
IDVPR   3070.01   3070.02                                                    INOUT
IDVSP   3070.01   3070.02                                                    INOUT
IE      3790.00   4150.01                                                    INOUT
IECON   3000.17=  3790.01=  4150.00                                         INOUT
IEV     4810.01=                                                            INOUT
IEVYR   3010.01=  3325.01=  3490.04   4710.02=  4790.00=  4800.00=          INOUT
IFLOW   3070.01   3070.02   3560.01   3560.01=  4410.05=  4410.05=          INOUT
IKODE   3630.02                                                             INOUT
ILST    3010.06=  3120.04   3120.04=  3120.07=  3130.00   3130.00=  3160.00=  INOUT
        3610.10=  3630.03   3630.07=                                         INOUT
INCLOF  3610.13   3630.04   3630.04=  3755.00                                 INOUT
INUM    3110.03                                                             INOUT
IP      3590.02=  4030.00=  4030.01   4030.02   4040.04   4040.04=  4050.00=  INOUT
        4060.00   4070.00   4080.00   4090.00   4100.00   4510.02=  4520.01   INOUT
        4520.02   4530.04   4540.00   4550.01   4570.00   4570.01   4580.01   INOUT
        4600.00   4600.01   4620.01   4620.03   4630.02=                      INOUT
IPER    3430.03=  3430.04=  3430.04=                                         INOUT
IPFRA   3000.19=  3280.00   3280.02=  3280.02=  3340.01   3340.03   3340.06   INOUT
        3400.00   3430.03                                                   INOUT
IPNT    3560.01   3560.01=                                                  INOUT
IPOW    4030.01   4520.01   4570.00                                         INOUT
IPR     4340.02=                                                            INOUT
IPRL    3000.12=  3260.00   3370.01                                         INOUT
IPRN    3610.08=  4120.01                                                   INOUT
IPRNT   3000.11=  3260.00   3370.01   3560.01   3560.01=                    INOUT
IPWKW   3000.13=  3260.00   3370.01                                         INOUT
IPWPR   3070.01   3070.02                                                   INOUT
IPWR    3570.00=  4340.01=                                                  INOUT
IPWYR   3010.02=  4050.01=  4620.00   4710.03=  4830.00=                    INOUT
IRES    4190.03=                                                            INOUT
IRESM   4190.06=  4210.04   4210.06   4660.09   4660.09=  4690.06   4690.10   INOUT
IRESP   4650.03=                                                            INOUT
IRG     3270.00   3380.06=                                                  INOUT
IRPT    3890.02   3900.03=                                                  INOUT
ISERV   4690.10=                                                            INOUT
*ISIGN  4690.10                                                             INOUT
ISMRY   3000.16=  3270.01=  3380.05=                                        INOUT
ISRCH   3860.01   4430.02                                                   INOUT
ISYSR   4650.04=                                                            INOUT
IT      4660.08   4660.09   4660.09=  4710.09=  4740.01   4740.03=  4740.04   INOUT
        4860.00=  4860.01                                                   INOUT
ITEMP   4320.03=  4320.04   4660.06=  4660.07   4660.09   4660.09=  4690.04=  INOUT
        4690.05   4880.02=  4880.03                                         INOUT
ITMP    3340.05=  3360.03   3610.04   3610.08   3660.04=  3670.00=  3670.03   INOUT
        3755.01=  3760.00   3775.00   3775.01   3820.02=  3820.03   3820.04   INOUT
        4130.03=  4130.04   4190.04=  4190.05   4190.06=  4190.08=  4190.09   INOUT
        4190.10=  4210.02=  4210.05=  4210.06   4220.01   4220.05=  4220.08=  INOUT
        4220.09   4230.01   4290.02=  4290.03   4300.01   4320.02=  4320.05=  INOUT
        4330.00   4330.01   4690.06=  4690.07=  4690.08   4690.10=            INOUT
ITP     4200.02=  4200.03   4200.04=  4200.05=  4210.00=  4210.03   4220.04=  INOUT
        4220.06   4240.04=  4240.05   4240.06=  4650.02=  4650.03=  4650.07=  INOUT
        4660.08   4690.08=  4690.09   4690.10=                              INOUT
ITSRV       .02       .54   3800.00   4170.01   4660.06                     INOUT
IUNIT   3000.03=  3200.00   3210.03=  3370.00   3485.00=  3490.02   3490.02=  INOUT
IUPDT   3000.14=  3260.00   3370.01                                         INOUT
IUPGI   4200.04=                                                            INOUT
IUPST   4190.10=  4220.07   4220.09                                         INOUT
IX      3010.04=  3330.00=  3330.01   3330.02   3530.01   3540.00   3580.01   INOUT
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        3590.00=                                                                INOUT
IYR     3070.01  3070.02                                                       INOUT
J       3340.12  4150.01                                                       INOUT
JBRN    3160.05= 3280.03= 3300.01= 3340.00                                     INOUT
JJ      3340.03= 3340.11= 3340.12                                              INOUT
JK      3340.08= 3340.13= 3340.14= 3340.15=                                    INOUT
JL      3610.12= 3660.01  3660.01= 3890.01                                     INOUT
JUPQI   3070.01  3070.02  3610.13  4200.01                                     INOUT
        3340.02= 3340.07= 3340.09  3340.10= 3360.01= 3360.02  3360.03=        INOUT
        3430.01= 3430.06= 3490.01  3610.11= 3630.05= 3630.06  3990.00         INOUT
        4000.00  4010.00  4020.00  4060.00  4070.00  4080.00  4090.00         INOUT
        4100.00  4110.00  4130.04  4170.01  4210.03  4210.04  4210.06         INOUT
        4220.06  4220.07  4220.09  4320.04  4330.00  4450.02= 4460.00         INOUT
        4470.01  4480.01  4490.01  4500.01  4540.00  4550.01  4570.01         INOUT
        4580.01  4600.01  4660.05  4660.06  4690.05  4690.06  4690.10         INOUT
        4880.03  4880.04=                                                     INOUT
KBR     3700.02= 3710.00= 3710.01                                              INOUT
KCPT    3570.05  3610.05  4880.02                                              INOUT
KDAYS   3000.23                                                               INOUT
KDIV    3740.03  3810.01=                                                      INOUT
KDT     4710.05= 4730.02  4730.02= 4770.00  4770.01= 4820.00  4820.00=        INOUT
        4840.00  4840.00=                                                     INOUT
KODE    4730.04=                                                              INOUT
KPER    4880.02                                                               INOUT
KPWR    4040.02                                                               INOUT
KPWRS   3580.01  4040.06=                                                     INOUT
KRES    3560.02= 3860.00                                                      INOUT
KSERV   4690.09                                                               INOUT
KUPQI   4200.05=                                                              INOUT
KX      3590.01= 3775.02= 3775.03= 3775.04=                                   INOUT
L       3680.02  3680.03  3680.04  3880.00  3890.00= 3890.02  3900.01=        INOUT
        3900.04  3900.06= 3920.01  3940.01= 3960.01  3960.02  3960.04=        INOUT
        4450.01  4450.02                                                     INOUT
LSV        .02  3890.00= 3900.01= 3960.02                                     INOUT
LTDP    3670.04                                                               INOUT
LTRC    3120.03                                                               INOUT
LTRJ    3160.01                                                               INOUT
M       3560.02= 3560.03= 3570.00= 3570.05  3570.06= 3580.00= 3610.04         INOUT
        3610.05  3610.07  3610.08= 3720.00  3730.03= 3730.04= 3740.00=        INOUT
        3755.02  3775.00= 3790.00  3800.00  3800.01= 3820.00  3820.01         INOUT
        3820.01= 3820.02  3820.03  3820.04  3830.00  3840.00  3840.01=        INOUT
        3850.00  3860.00= 3860.01  3890.02  3900.04  3900.06= 3920.01         INOUT
        3940.01= 3960.04= 3990.00  4000.00  4010.00  4020.00  4110.00         INOUT
        4120.01  4120.02  4130.02  4130.03  4150.01  4170.01  4190.01         INOUT
        4190.01= 4190.03= 4190.04  4190.05= 4190.06= 4190.10  4200.04         INOUT
        4210.00  4210.04  4210.06  4220.04  4220.07  4220.09  4240.02         INOUT
        4240.03= 4240.04  4240.05= 4240.06= 4240.08= 4280.01= 4280.02         INOUT
        4290.02  4290.03  4300.01  4320.00  4320.03  4330.00  4340.01=        INOUT
        4340.02  4350.01  4370.00= 4370.01  4390.01  4410.02= 4410.03=        INOUT
        4410.04= 4410.05  4410.05= 4420.02= 4420.04= 4420.05= 4430.02=        INOUT
        4430.02  4460.00  4470.01  4480.01  4490.01  4500.01  4650.03         INOUT
        4650.04= 4660.02= 4660.03  4660.06  4660.09  4660.09= 4690.02=        INOUT
        4690.03  4690.04  4690.06  4690.10  4800.01  4810.01=                 INOUT
MDIV    3610.00= 3740.04= 3810.00= 3810.00= 3810.02= 4120.01  4240.00         INOUT
MDNST   3610.04  3610.05  4120.01  4190.07= 4190.08  4190.09= 4190.10=        INOUT
        4200.00= 4200.02  4200.03= 4200.04= 4210.01  4210.01= 4210.02         INOUT
        4210.06  4220.01  4220.03  4220.05  4220.09  4230.01  4320.01         INOUT
        4320.02  4330.00  4330.01= 4660.00=                                   INOUT
METRC   3000.04= 3200.00  3220.00  3370.00  3380.04  3380.04=                 INOUT
MPSYS   4030.02  4040.05= 4040.05= 4520.02  4650.00  4650.01= 4650.02         INOUT
        4650.03= 4650.04                                                      INOUT
MPWR    3610.02= 4040.03= 4120.01  4340.00= 4510.01                           INOUT
MQ      3775.03=                                                              INOUT
MRES    3610.01= 3870.01= 4120.01  4190.00  4200.01= 4220.02  4320.00         INOUT
        4420.01                                                               INOUT
MT      3890.02                                                               INOUT
MX      4660.01  4660.02  4690.01  4690.02                                     INOUT
N       3890.01                                                               INOUT
NCPT    3570.01= 3610.06= 3610.07= 4660.01  4690.01                           INOUT
NCYCL   3490.03=                                                              INOUT
NDAYS   3000.23= 3310.00  3340.05  3340.10= 3340.14= 3360.01= 3420.01=        INOUT
        3430.05  3430.06  4630.01                                            INOUT
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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NDIV | 3570.03= | 3740.02= | 3740.03 | 3740.06= | 3810.00 | 3810.00= | 3810.01= | INOUT |
| | 3810.03 | 3810.04 | 3810.05 | 3810.05= | 4240.01= | 4240.02= | 4240.03 | INOUT |
| | 4240.07 | 4240.08 | 4240.09= | 4240.10= | 4240.11 | 4260.00 | 4260.00 | INOUT |
| | 4270.02= | 4280.00= | | | | | | INOUT |
| NDIVF | 3820.00 | 3820.02 | 4280.02 | 4290.02 | | | | INOUT |
| NDIVR | 4240.04 | 4240.05= | 4320.00 | 4320.02 | 4320.03 | 4330.01= | | INOUT |
| NDVYR | 4710.07= | 4820.00 | 4820.00= | 4870.02= | | | | INOUT |
| NFLOW | 4710.06= | 4780.00= | 4870.01= | | | | | INOUT |
| NFLW | 3775.00= | 4120.02 | 4130.02 | 4130.03 | | | | INOUT |
| NL | 3070.01 | 3070.02 | 3880.00 | 3960.01 | 4450.01 | 4450.02 | | INOUT |
| NLF | 3560.00= | | | | | | | INOUT |
| NLYR | 4710.08= | 4850.00 | 4850.00= | | | | | INOUT |
| NPER | 3000.18= | 3280.00 | 3280.01 | 3280.01= | 3290.00 | 3310.00 | 3320.00 | INOUT |
| | 3330.01 | 3340.06 | 3400.00= | 3410.01 | 3420.01 | 3430.02 | 3430.04 | INOUT |
| | 3430.04= | 3500.00 | 3510.01 | 3540.00 | 3730.02= | 3740.05 | 3810.04 | INOUT |
| | 3810.05 | 3810.05 | 3830.00 | 3840.00 | 3850.00 | 3900.05 | 3920.00 | INOUT |
| | 3920.01 | 3940.00 | 3960.03 | 4050.00 | 4260.00 | 4260.00 | 4270.01 | INOUT |
| | 4350.01 | 4370.01 | 4390.01 | 4410.00 | 4420.02= | 4420.05= | 4440.03 | INOUT |
| | 4460.00 | 4620.01 | 4620.02 | 4870.00 | | | | INOUT |
| NPWR | 3570.04= | 4040.01= | 4040.02 | 4340.01 | 4340.02= | 4510.02 | | INOUT |
| NPWRS | 3010.03= | 3330.02= | 3530.00 | 3530.01 | 4040.05= | 4040.05= | 4040.06= | INOUT |
| NQYR | 4710.04= | 4840.00 | 4840.00= | 4870.03= | | | | INOUT |
| NRES | 3570.02= | 4190.02= | | | | | | INOUT |
| NRESP | 3590.00= | 4650.01= | 4650.02 | | | | | INOUT |
| NRESR | 4190.01 | 4190.01= | 4190.04 | 4190.05= | 4210.00 | 4210.01 | 4210.01= | INOUT |
| | 4210.02 | 4220.01 | 4660.07 | 4690.03 | 4690.04 | | | INOUT |
| NSERV | 3560.03= | 4690.07= | 4690.08 | | | | | INOUT |
| NSTOR | .54 | | | | | | | INOUT |
| NTAB | 3680.01= | 3680.04= | 4470.01 | 4480.01 | 4490.01 | 4500.01 | | INOUT |
| NTS | 3610.03= | 3800.00 | 3800.01 | 4120.01 | 4170.00 | 4170.01 | 4180.01= | INOUT |
| | 4660.03= | 4660.04 | 4660.05 | | | | | INOUT |
| NTSRV | .02 | .54 | 3800.01= | 4660.03 | 4880.04= | | | INOUT |
| NUPQI | 3570.06= | 4200.02 | 4200.03= | | | | | INOUT |
| NUPST | 3580.00= | 4190.08 | 4190.09= | 4220.04 | 4220.05 | 4230.01 | | INOUT |
| NYRS | 3070.01 | 3070.02 | | | | | | INOUT |
| OVLOD | 4030.01 | 4040.04 | 4040.04= | 4520.01 | | | | INOUT |
| PFMAX | 4030.02 | 4520.02 | | | | | | INOUT |
| PKPWR | 4080.00 | 4570.01 | | | | | | INOUT |
| POWR | 4050.00= | 4620.01 | 4620.03 | 4630.02= | | | | INOUT |
| PWRMX | 4030.01 | 4520.01 | 4630.02 | | | | | INOUT |
| PWRS | 3330.01 | 3540.00 | | | | | | INOUT |
| QCAP | 4010.00 | 4490.01 | | | | | | INOUT |
| QDIV | 3740.06= | 3810.03 | 3810.04 | 3810.05 | 3810.05= | 4240.07= | 4240.09 | INOUT |
| | 4240.10 | 4260.00 | 4260.00 | 4270.02= | 4280.00 | | | INOUT |
| QDIVS | 4280.00= | | | | | | | INOUT |
| QDV | 3720.00 | 3740.01= | 3740.06 | 3810.06= | 4120.02 | 4260.00= | | INOUT |
| QLKG | 3860.01 | 4430.02 | | | | | | INOUT |
| QM2 | 3720.00 | 3740.00 | 3840.01= | 4120.02 | 4370.00= | | | INOUT |
| QMIN | 3730.04= | 3830.00 | 4350.01 | 4410.03= | 4410.05 | 4410.05 | | INOUT |
| QMIN2 | 3740.00= | 3840.00 | 4370.01 | 4410.04= | | | | INOUT |
| QMN | 3720.00 | 3730.04 | 3830.01= | 4120.02 | 4350.00= | | | INOUT |
| QMX | 3730.03= | 3850.00 | 4390.01 | 4410.02= | | | | INOUT |
| QMXX | 3720.00 | 3730.01 | 3730.01= | 3730.03 | 3850.01= | 4120.02 | 4390.00= | INOUT |
| QT | 4060.00 | 4540.00 | | | | | | INOUT |
| QUNIT | 3000.08= | 3200.00 | 3210.06= | 3220.01= | 3370.00 | | | INOUT |
| RTIO | 3775.04= | | | | | | | INOUT |
| RTIOD | 4240.01= | 4240.10= | 4240.11 | | | | | INOUT |
| STOR | 3990.00 | 4470.01 | | | | | | INOUT |
| STOR1 | 4430.00= | 4430.02 | | | | | | INOUT |
| STORA | 4420.04= | 4430.00 | | | | | | INOUT |
| STORB | 4420.05= | | | | | | | INOUT |
| STORL | 3890.02 | 3900.04 | 3900.06= | 3920.01 | 3940.01= | 3960.04= | 4460.00 | INOUT |
| SYDYS | 3490.01= | 3490.02 | 3490.02 | | | | | INOUT |
| TEMP | 3340.04= | 3360.02 | 3900.04= | 3900.06 | | | | INOUT |
| TITLE | 3010.08 | 3030.00 | 3040.00 | 3060.02 | | | | INOUT |
| TL | 4070.00 | 4550.01 | | | | | | INOUT |
| TLWEL | 4030.01 | 4520.01 | 4530.04 | | | | | INOUT |
| TMP | 4410.01= | 4410.02 | 4410.03 | 4410.04 | | | | INOUT |
| TMPP | 3755.03= | 3760.00 | 3775.04 | 4130.04 | | | | INOUT |
| TMPR | 4410.05 | 4410.05= | | | | | | INOUT |
| VLMT | 3220.02 | | | | | | | INOUT |
| VOLU | 3000.10 | 3210.07 | | | | | | INOUT |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| VUNIT | 3000.10= | 3200.01 | 3210.07= | 3220.02= | 3370.01 | | | INOUT |
| AL | 5230.07= | 5240.02 | 5240.02= | 5240.03= | 5240.03= | 5260.00 | 5260.05 | COMP |
| | 5650.05= | 5660.01= | 5670.01= | 5680.00 | 5690.03= | 5690.04 | 5700.00= | COMP |
| | 5710.00 | 5710.00= | 5720.02 | 5780.00= | 5780.01= | 5820.06 | 5850.03 | COMP |
| | 5850.05 | 5900.01 | 6410.08= | 6410.09 | | | | COMP |
| ANDYS | .48 | .49 | .50 | .52 | | | | COMP |
| AREA | 5130.03 | | | | | | | COMP |
| AREAV | 5130.03= | 5130.07 | | | | | | COMP |
| ATMP | 6310.12= | 6310.13 | 6310.13= | 6410.01= | 6410.05 | 6410.09 | | COMP |
| CEVAP | 5130.07 | | | | | | | COMP |
| CFLOD | 5230.02 | 5730.02 | 5730.02 | | | | | COMP |
| CKW | .44= | .45 | .45= | 5370.01 | 5450.02 | 5470.09 | 6130.04 | COMP |
| CLOCL | 5230.02 | 5230.11 | 5580.05 | 5730.02 | 5730.02 | 6100.08 | 6100.08 | COMP |
| CNST | .52= | 5370.01 | 5370.03 | 5370.03 | 6140.00 | 6160.08 | 6160.09 | COMP |
| | 6220.08 | 6230.07 | 6300.02 | 6310.12 | | | | COMP |
| CNTRL | 6410.00= | 6410.06= | 6410.09 | | | | | COMP |
| CONST | .50 | | | | | | | COMP |
| CPWR | 5370.01= | 5370.02 | 5450.02= | 5450.03 | 5470.09= | 5470.10 | 6130.04= | COMP |
| | 6130.07 | | | | | | | COMP |
| CQDEL | 6030.01 | 6050.01 | 6050.02 | 6050.02 | 6060.01 | 6080.01 | 6080.02 | COMP |
| | 6080.02 | | | | | | | COMP |
| CQS | .50= | .51 | 5990.01 | | | | | COMP |
| CSQ | .51= | 5230.13 | 5230.13 | 5400.00 | | | | COMP |
| CT | .49= | 6280.03 | 6280.03 | 6430.09 | 6440.00 | 6440.01 | 6440.02 | COMP |
| | 6440.03 | 6440.04 | 6440.05 | 6440.06 | 6440.07 | 6450.04 | 6450.05 | COMP |
| | 6450.13 | | | | | | | COMP |
| CTX | 6280.02= | 6280.03 | 6280.03= | 6300.04 | 6300.05 | 6300.06 | 6300.18 | COMP |
| | 6310.00 | 6320.01 | 6320.02 | 6320.05 | 6320.09 | | | COMP |
| DFUNC | 5170.00 | 5180.00 | 5190.00 | | | | | COMP |
| DPARA | 5170.00 | 5180.00 | 5190.00 | | | | | COMP |
| EFCV | 5130.16 | | | | | | | COMP |
| EFFCV | 5130.15 | 5370.03 | 5370.03= | 5450.04 | 5450.04= | 5470.11 | 5470.11= | COMP |
| | 6130.08= | 6130.08= | | | | | | COMP |
| EFV | 5130.16= | 5370.01 | 5370.03 | 5370.03 | 5450.02 | 5450.04 | 5450.04 | COMP |
| | 5470.09 | 5470.11 | 5470.11 | 6130.04 | 6130.08 | 6130.08 | | COMP |
| EL | 5130.11 | 6020.03 | | | | | | COMP |
| ELEV | 5130.11= | 5130.12 | 5130.12= | 5360.00 | 5370.00 | 6020.03= | | COMP |
| EVAPO | 5010.00 | | | | | | | COMP |
| EVP | 5130.05 | 5130.05 | 6340.03= | 6340.04 | | | | COMP |
| EVPO | 5010.00= | 5130.04 | | | | | | COMP |
| EVTMP | .03 | 5130.07= | 5230.13 | 5230.13 | 5400.00 | 5990.01 | 5990.03= | COMP |
| | 6340.03 | | | | | | | COMP |
| HEAD | 5370.00= | 5370.02 | 5450.03 | 5470.10 | 6130.07 | | | COMP |
| I | .46= | .48 | 5000.00 | 5010.00 | 5010.01 | 5130.05 | 5130.05 | COMP |
| | 5130.11= | 5130.12 | 5130.12= | 5140.04= | 5140.05= | 5140.06 | 5150.03= | COMP |
| | 5150.04= | 5150.05= | 5160.00 | 5170.00 | 5180.00 | 5200.00 | 5200.00= | COMP |
| | 5200.01= | 5200.02= | 5210.05 | 5230.01 | 5230.01= | 5230.02 | 5230.11 | COMP |
| | 5230.12 | 5230.12 | 5280.03 | 5280.03 | 5350.04 | 5350.06 | 5370.00 | COMP |
| | 5370.02 | 5370.03 | 5370.03 | 5370.05 | 5370.06= | 5380.00= | 5400.00 | COMP |
| | 5410.00= | 5410.02= | 5410.03 | 5410.06 | 5410.07= | 5410.08 | 5410.09= | COMP |
| | 5510.00 | 5530.01 | 5530.01 | 5540.04= | 5580.05 | 5590.02 | 5590.08= | COMP |
| | 5610.01= | 5620.07 | 5620.07= | 5620.08= | 5650.00 | 5690.00 | 5730.03 | COMP |
| | 5730.05 | 5790.00 | 5800.01 | 5800.02 | 5810.00= | 5810.01= | 5820.00 | COMP |
| | 5820.00= | 5820.06 | 5860.00 | 5880.02= | 5880.03= | 5890.00= | 5890.01= | COMP |
| | 5890.02= | 5900.01 | 5920.05 | 5930.01= | 5930.02= | 5930.04 | 5930.05 | COMP |
| | 5930.06= | 5930.07= | 5940.03= | 5940.04= | 5960.00= | 5960.01 | 5970.04= | COMP |
| | 5980.00= | 5980.01 | 5980.01= | 5990.01= | 5990.02= | 5990.03 | 5990.04= | COMP |
| | 6000.00 | 6000.03 | 6020.02 | 6020.02 | 6020.03= | 6020.06 | 6060.01 | COMP |
| | 6080.02 | 6080.02 | 6090.00= | 6100.04 | 6100.04= | 6100.13 | 6110.00 | COMP |
| | 6110.02 | 6120.00= | 6130.06 | 6130.06= | 6130.07= | 6130.08 | 6130.08= | COMP |
| | 6130.09 | 6130.11 | 6130.11= | 6140.00= | 6150.03 | 6160.07 | 6160.08 | COMP |
| | 6160.12= | 6160.12= | 6160.13= | 6160.13= | 6160.15 | 6160.21 | 6160.21= | COMP |
| | 6180.01 | 6180.02 | 6210.04= | 6210.05 | 6210.07 | 6210.07= | 6220.09 | COMP |
| | 6230.00 | 6230.01 | 6230.02 | 6230.07= | 6230.09 | 6230.09= | 6250.00 | COMP |
| | 6250.05= | 6250.07 | 6250.07= | 6300.03 | 6300.03= | 6300.04 | 6300.05 | COMP |
| | 6300.06 | 6300.07= | 6300.08= | 6300.09= | 6300.09= | 6300.10= | 6300.10= | COMP |
| | 6300.11= | 6300.11= | 6300.12= | 6300.12= | 6300.13= | 6300.13= | 6300.14= | COMP |
| | 6300.14= | 6300.17 | 6300.18 | 6310.00 | 6310.04 | 6310.05= | 6310.10 | COMP |
| | 6310.11= | 6310.14= | 6320.01 | 6320.02 | 6320.03= | 6320.04= | 6320.04= | COMP |
| | 6320.05 | 6320.06 | 6320.06= | 6320.07= | 6320.07= | 6320.08= | 6320.08= | COMP |
| | 6320.09 | 6340.03= | 6340.04 | 6340.05 | 6340.08 | 6340.09 | 6350.02= | COMP |
| | 6360.00 | 6360.00= | 6360.01= | 6360.01= | 6370.00= | 6370.00= | 6370.01= | COMP |

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        6410.09  6430.00  6430.01  6430.01= 6430.02= 6430.02= 6430.03= COMP
        6430.03= 6430.05= 6430.06  6430.06= 6430.07= 6430.07= 6430.08= COMP
        6430.08= 6430.09  6440.00  6440.01  6440.02  6440.03  6440.04  COMP
        6440.05  6440.06  6440.07  6450.03= 6450.04  6450.05  6450.07= COMP
        6450.08= 6450.08= 6450.10  6450.10= 6450.11= 6450.11= 6450.12= COMP
        6450.12= 6450.13                                              COMP
ICONS   5230.20= 5230.20= 5440.02  5440.02= 5530.06= 5530.06=         COMP
ICPT    5080.02  5140.02  5940.02  6100.03  6340.01                   COMP
ICSE    5140.05= 5380.00= 5810.00= 5890.00=                           COMP
ID      5020.08= 5020.09= 5020.10  5020.10= 5020.11= 5020.12  5020.13= COMP
        5020.14  5020.14= 5140.09= 5140.10  5150.00= 5150.01  5150.03= COMP
        5150.04= 5150.05= 5160.00  5200.00  5200.00= 5200.01= 5200.02= COMP
        5210.03= 5210.04  5210.04= 5210.05  5280.01= 5280.03  5280.03= COMP
        5410.04= 5410.04= 5410.05= 5410.06  5410.07= 5410.08  5440.06= COMP
        5530.01  5530.01= 5540.01= 5540.02  5540.04= 5590.05= 5590.06  COMP
        5590.08= 5620.06= 5620.07  5620.07= 5620.08= 5930.03= 5930.04  COMP
        5940.06= 5940.07  5950.00= 5960.00  5960.01  6450.02  6450.03= COMP
        6450.04= 6450.05= 6450.06  6450.07= 6450.08  6450.08= 6450.09  COMP
        6450.10  6450.10= 6450.11= 6450.11= 6450.12= 6450.12= 6450.13= COMP
IDBAS   5150.01                                                       COMP
IDCPT   5160.02                                                       COMP
IDGST   5610.00  5820.05= 5900.00=                                    COMP
IDIV    5020.09  5140.09  5150.02  5210.03  5280.01  5440.06  5540.01  COMP
        5590.05  5620.01= 5620.06  5930.02  5930.03  5940.06           COMP
IDIVF   5160.01  5160.03                                             COMP
IDIVR   5210.02                                                       COMP
IDPR    5350.00= 5350.01                                              COMP
IDSHT   6450.10  6450.10=                                            COMP
IDV     6450.09                                                       COMP
IDVPR   5620.03  5620.03=                                            COMP
IDVSP   5530.07= 5590.01=                                             COMP
IEV     5130.05  5130.05=                                            COMP
IFC     5650.01= 5720.03= 5880.00= 5910.01                            COMP
*INTPOL 5170.00  5180.00  5190.00                                     COMP
IOPER      .03   5420.03= 5430.01  5440.16  5470.00  5470.00=         COMP
IP         .54      .55= 5000.00  5130.14= 5130.15  5130.16= 5280.07= COMP
        5280.08= 5280.10  5300.01  5300.02  5330.00  5330.01  5330.02= COMP
        5340.00= 5350.00  5350.01  5350.02  5350.03  5350.03  5360.00= COMP
        5360.01  5360.01= 5360.02= 5360.02= 5370.00= 5370.01  5370.02  COMP
        5370.03  5370.03= 5370.08  5450.01= 5450.02  5450.03  5450.04  COMP
        5450.04= 5470.08= 5470.09  5470.10  5470.11  5470.11= 5500.00= COMP
        5500.02  6020.05= 6020.06  6020.07  6030.01  6050.01  6050.02  COMP
        6050.02  6060.01  6080.01  6080.02  6080.02  6090.00= 6130.02  COMP
        6130.03  6130.04  6130.07= 6130.08= 6130.08= 6130.09= 6130.10  COMP
        6130.11  6130.11= 6140.00= 6160.06= 6160.07  6160.08  6160.09  COMP
        6160.12= 6160.12= 6160.13= 6160.13= 6160.15  6160.21  6160.21= COMP
        6180.01  6180.02  6210.03= 6210.04= 6210.05  6210.06= 6210.07  COMP
        6210.07= 6220.07= 6220.08  6220.09  6230.00  6230.06= 6230.07= COMP
        6230.08= 6230.09  6230.09= 6250.04= 6250.05= 6250.06= 6250.07  COMP
        6250.07= 6300.00  6300.01  6300.02  6300.03  6300.03= 6300.04= COMP
        6300.05= 6300.06= 6300.07= 6300.08= 6300.09  6300.09= 6300.10= COMP
        6300.10= 6300.11= 6300.11= 6300.12= 6300.12= 6300.13= 6300.13= COMP
        6300.14= 6300.14= 6300.17  6300.18= 6310.00= 6310.09= 6310.10  COMP
        6310.12                                                       COMP
IPER    5010.01                                                       COMP
IPERA   5020.03                                                       COMP
IPOW    6020.07  6130.10=                                            COMP
IPR     6130.03  6300.01                                              COMP
IPWKW   6280.03  6280.03=                                             COMP
IPWPR   5440.22= 5440.22= 5690.01  5690.01= 6160.18  6160.18=         COMP
IPWR    5130.13= 5130.14  5280.06  5280.07  5450.00= 5450.01  5470.07= COMP
        5470.08  5500.00  6020.04= 6020.05  6160.06  6210.03  6220.07  COMP
        6230.06  6250.04  6310.09                                     COMP
IPX        .03      .55= 5500.02  6210.06= 6210.07  6210.07= 6230.08= COMP
        6230.09  6230.09= 6250.06= 6250.07  6250.07=                  COMP
IR      5230.15= 5230.16  5230.17  5230.18  5230.18= 5230.19  5230.19= COMP
        5230.20= 5230.20= 5230.21= 5230.21= 5230.22= 5260.02= 5260.03  COMP
        5260.03= 5260.04= 5260.05= 5470.03= 5470.06  5490.00  5500.05= COMP
        5500.06  5500.06= 5510.00= 5580.07= 5590.00  5780.03= 5780.04  COMP
        5780.04= 5780.05  5780.07  5780.10  5800.00  5800.01  5800.02  COMP
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          5820.03= 5820.03= 5820.04= 5820.04= 5820.06  9850.01= 5850.02  COMP
          5850.02= 5850.06  5850.07  5850.07  5850.08  5850.10  5850.11  COMP
          5850.13  5870.00= 5870.01= 5880.01= 5880.02  5880.03  5890.00= COMP
          5890.01= 5890.02= 5900.01  5970.03= 5970.04  5980.00  6100.12= COMP
          6100.13  6110.00  6110.06= 6120.00=                            COMP
IRA       5420.01= 5420.02  5420.03= 5430.00= 5430.01  5440.04= 5440.05  COMP
          5440.05= 5440.06  5440.07  5440.10  5440.13= 5440.14= 5440.15= COMP
          5440.16= 5440.17= 5440.18= 5440.18= 5440.20  5440.21  5440.21= COMP
          5440.22= 5440.22= 5450.00= 5450.01  5450.03  5450.04  5450.04  COMP
          5450.05= 5450.05= 5470.00  5470.00= 5470.03  5470.06= 5470.07= COMP
          5470.08  5470.10  5470.11  5470.11  5470.12= 5470.12= 5490.00  COMP
          5500.00  5500.01  5500.03  5500.05  5520.00  5520.00= 5520.02= COMP
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          5530.08= 5540.00= 5540.01  5540.03  5540.05= 5550.00= 5550.01= COMP
          5560.00= 5560.00= 5780.10= 5790.00  5850.13= 5860.00  5920.04= COMP
          5920.05                                                        COMP
IRES      5080.05= 5230.04= 5230.04= 5230.12  5230.12= 5280.00  5580.01  COMP
          5620.09= 5630.02= 5630.02= 5730.02  5730.02= 5920.00  5980.01= COMP
          5980.01= 5990.00= 6100.08  6100.08= 6340.02                    COMP
IRESM     5260.02  5420.01  5440.04  5500.05  5780.03  5850.01           COMP
IRESP     6160.05  6210.02  6220.06  6230.05  6250.03  6310.08           COMP
ISHDV     5020.08                                                        COMP
ISHQ      5040.02  5050.02                                               COMP
ISHR      5010.04                                                        COMP
ISPER     5010.01  5020.03                                               COMP
ISRCH     5530.04= 5530.04=                                              COMP
ISYSR     5440.16= 5500.01  6300.15                                      COMP
ITEMP     5210.02= 5210.03  5280.09= 5290.00= 5370.07= 6150.02= 6160.04  COMP
          6210.01  6220.05  6230.04  6250.02  6310.06= 6310.07           COMP
ITMP      5080.07= 5080.08  5150.01= 5150.02= 5150.03  5150.04  5210.00= COMP
          5210.01  5230.05= 5230.06  5230.14  5350.01= 5360.00  5500.03= COMP
          5500.04  5580.02= 5580.06  5780.07= 5780.08  5780.09  5850.11= COMP
          5850.12  5920.02= 5920.03  6000.01  6000.02  6100.02= 6100.03  COMP
ITP       5160.02= 5170.00  5180.00  5190.00  5720.00= 5720.01  5730.01= COMP
          5730.09  5730.10  5730.11= 5730.12  5780.09  5780.10  5850.12  COMP
          5850.13  5920.03  5920.04  6160.17= 6160.18  6160.18= 6160.19= COMP
          6160.20  6340.07= 6340.09                                      COMP
IUPST     5230.15  5470.03  5580.07  5780.10  5850.13  5920.04  5970.03  COMP
          6100.12  6110.06                                              COMP
IX        5020.03= 5020.04  5020.04= 5020.05= 5020.05= 5020.11= 5020.12= COMP
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          5050.03= 5350.04= 5350.06= 5350.07  5350.07= 5360.00  5440.12  COMP
          5440.13= 5440.15= 5440.16  5440.17= 5440.18  5440.18= 5440.21  COMP
          5440.21= 5440.22= 5440.22= 5450.05= 5450.05= 5470.05  5470.06= COMP
          5470.12= 5470.12= 6150.01= 6150.02  6150.03  6160.05  6160.15  COMP
          6160.20  6170.00= 6210.02  6210.04  6210.07  6210.07= 6220.06  COMP
          6230.01  6230.02  6230.05  6230.09  6230.09= 6250.00  6250.03  COMP
          6250.07  6250.07= 6280.05= 6290.00= 6300.15= 6300.16  6300.17= COMP
          6310.02= 6310.03  6310.06  6310.08  6320.02  6320.03  6320.04  COMP
          6320.04= 6320.07= 6320.07= 6320.08= 6320.08=                   COMP
J              .01  5130.12= 5130.12=                                    COMP
K         5020.02  5020.03  5080.08= 5080.09  5080.10  5090.00= 5130.01  COMP
          5130.02  5130.02  5130.03  5130.08  5130.11  5130.16  5210.01  COMP
          5210.02  5230.14  5230.15  5260.01  5260.02  5300.00  5300.01  COMP
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          5340.00  5420.00  5420.01  5470.02= 5470.03  5500.04  5500.05  COMP
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          6080.02  6090.00  6100.11  6100.12  6110.05= 6110.06  6160.04  COMP
          6160.05  6160.07= 6160.11= 6160.11= 6160.12  6160.12  6190.00  COMP
          6210.01  6210.02  6220.05  6220.06  6230.04= 6230.05  6250.02= COMP
          6250.03  6310.07  6310.08                                      COMP
KA        5440.03= 5440.04                                              COMP
KPWR      6310.03                                                       COMP
KX        5020.07= 5020.08  5040.01  5040.02  5050.01  5050.02           COMP
L         5230.09  5230.17  5230.19= 5230.19= 5230.22= 5240.01  5250.01= COMP
          5260.05  5390.00= 5400.00= 5440.09= 5440.10  5440.13= 5440.15= COMP
          5440.17= 5440.18= 5440.18= 5440.19= 5440.22= 5440.22= 5450.05= COMP
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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5450.05≡ | 5470.00 | 5470.00≡ | 5470.06≡ | 5470.12≡ | 5470.12≡ | 5490.00 | COMP |
| | 5500.01 | 5500.02 | 5510.00≡ | 5520.00 | 5520.00≡ | 5520.01≡ | 5520.02≡ | COMP |
| | 5520.02≡ | 5520.03≡ | 5520.03≡ | 5520.04≡ | 5520.04≡ | 5530.03 | 5530.03≡ | COMP |
| | 5530.04≡ | 5530.04≡ | 5530.06≡ | 5530.06≡ | 5540.00≡ | 5540.03 | 5550.01≡ | COMP |
| | 5560.00 | 5560.00≡ | 5580.04≡ | 5580.05≡ | 5590.00≡ | 5590.01 | 5590.04≡ | COMP |
| | 5590.07 | 5590.10≡ | 5630.00≡ | 5630.01≡ | 5630.02 | 5630.02≡ | 5650.02 | COMP |
| | 5650.03 | 5650.04 | 5660.00 | 5660.01 | 5730.07≡ | 5730.09≡ | 5730.12 | COMP |
| | 5730.13 | 5740.01≡ | 5750.01 | 5750.02 | 5750.02 | 5780.00 | 5780.05 | COMP |
| | 5850.03≡ | 5850.04 | 5850.06 | 5850.07≡ | 5850.07≡ | 6150.04 | 6160.00≡ | COMP |
| | 6160.14≡ | 6160.15 | 6160.19≡ | 6170.00≡ | 6170.01≡ | 6190.02 | 6190.03 | COMP |
| | 6190.04 | 6190.04≡ | 6200.01≡ | 6210.04 | 6410.02 | 6410.03 | 6410.04 | COMP |
| | 6410.06 | 6410.08 | | | | | | COMP |
| LA | 5840.06≡ | 5550.00≡ | | | | | | COMP |
| LCNS | 5440.01≡ | 5440.02 | 5440.02≡ | | | | | COMP |
| LX | 5440.08 | 5440.09 | 5580.03 | 5580.04 | | | | COMP |
| M | 5010.04≡ | 5020.00 | 5040.02≡ | 5040.03 | 5040.04 | 5040.04≡ | 5050.02≡ | COMP |
| | 5050.03 | 5050.03≡ | 5080.02≡ | 5080.03 | 5080.03≡ | 5080.04≡ | 5080.04≡ | COMP |
| | 5080.05≡ | 5080.06 | 5080.06≡ | 5080.09 | 5080.10 | 5110.00 | 5130.01 | COMP |
| | 5130.02 | 5130.02 | 5130.03 | 5130.05 | 5130.05≡ | 5130.07≡ | 5130.08 | COMP |
| | 5130.09 | 5130.09≡ | 5130.10≡ | 5130.10≡ | 5130.11≡ | 5130.12 | 5130.12≡ | COMP |
| | 5130.13≡ | 5130.14 | 5140.02≡ | 5140.03 | 5140.04≡ | 5140.05≡ | 5140.06≡ | COMP |
| | 5140.07≡ | 5140.08 | 5140.09 | 5160.01 | 5160.02 | 5160.03 | 5170.00 | COMP |
| | 5180.00 | 5190.00 | 5210.00 | 5210.02 | 5210.05≡ | 5230.00 | 5230.01 | COMP |
| | 5230.01≡ | 5230.02≡ | 5230.03 | 5230.03≡ | 5230.04≡ | 5230.04≡ | 5230.05 | COMP |
| | 5230.11 | 5230.12 | 5230.12≡ | 5230.13 | 5230.13 | 5230.15 | 5240.01 | COMP |
| | 5240.03 | 5240.03 | 5260.02 | 5260.04≡ | 5280.00 | 5280.01 | 5280.04≡ | COMP |
| | 5280.06 | 5280.07 | 5300.01 | 5330.01 | 5370.00 | 5370.02≡ | 5370.03 | COMP |
| | 5370.03≡ | 5370.04 | 5370.05 | 5370.06≡ | 5380.00≡ | 5400.00≡ | 5400.01≡ | COMP |
| | 5400.02≡ | 5400.03≡ | 5410.00≡ | 5410.01≡ | 5410.02≡ | 5410.03 | 5410.07 | COMP |
| | 5410.08≡ | 5410.09≡ | 5420.01 | 5440.04 | 5440.14≡ | 5500.01 | 5520.00 | COMP |
| | 5520.00≡ | 5560.00 | 5560.00≡ | 5580.01 | 5580.02 | 5580.05≡ | 5580.07 | COMP |
| | 5590.00≡ | 5590.02 | 5590.03 | 5590.03≡ | 5590.04≡ | 5590.05 | 5590.07 | COMP |
| | 5590.09≡ | 5590.10≡ | 5610.01≡ | 5620.01≡ | 5620.02 | 5620.03 | 5620.03 | COMP |
| | 5620.06 | 5620.09≡ | 5620.10≡ | 5620.11≡ | 5620.12 | 5620.12≡ | 5630.01≡ | COMP |
| | 5630.02 | 5630.02≡ | 5640.01 | 5640.01≡ | 5640.02≡ | 5640.03 | 5640.03≡ | COMP |
| | 5650.00 | 5650.03 | 5660.01 | 5690.00 | 5690.02≡ | 5690.03 | 5730.02 | COMP |
| | 5730.02≡ | 5730.03 | 5730.04 | 5730.04≡ | 5730.05 | 5730.08 | 5730.10 | COMP |
| | 5730.13 | 5750.01 | 5750.02 | 5750.02 | 5780.03 | 5800.00 | 5810.00 | COMP |
| | 5850.01 | 5880.01 | 5890.00 | 5920.00 | 5920.02 | 5920.04 | 5930.01≡ | COMP |
| | 5930.02 | 5930.03 | 5930.04 | 5930.05≡ | 5930.06≡ | 5930.07≡ | 5940.02≡ | COMP |
| | 5940.03≡ | 5940.04≡ | 5940.06 | 5960.00≡ | 5970.00 | 5970.01 | 5970.03 | COMP |
| | 5970.04≡ | 5980.00≡ | 5980.01 | 5980.01≡ | 5990.00≡ | 5990.01≡ | 5990.02 | COMP |
| | 5990.03≡ | 5990.04≡ | 6000.00≡ | 6000.03 | 6000.04 | 6020.01 | 6020.02 | COMP |
| | 6020.02 | 6020.03≡ | 6020.04≡ | 6020.05 | 6030.01 | 6050.02 | 6050.02 | COMP |
| | 6060.01 | 6080.02 | 6080.02 | 6100.03≡ | 6100.04 | 6100.04≡ | 6100.05≡ | COMP |
| | 6100.06 | 6100.08 | 6100.08≡ | 6100.12 | 6110.02 | 6110.06 | 6130.03≡ | COMP |
| | 6130.05 | 6130.06 | 6130.06≡ | 6130.07 | 6130.08 | 6130.08 | 6160.05≡ | COMP |
| | 6160.06 | 6160.15 | 6160.20 | 6170.00≡ | 6210.02≡ | 6210.03 | 6210.04 | COMP |
| | 6220.06≡ | 6220.07 | 6230.05≡ | 6230.06 | 6250.03≡ | 6250.04 | 6300.01≡ | COMP |
| | 6300.10≡ | 6300.10≡ | 6300.11≡ | 6300.11≡ | 6300.12≡ | 6300.12≡ | 6300.13≡ | COMP |
| | 6300.13≡ | 6300.15 | 6310.08≡ | 6310.09 | 6340.01≡ | 6340.02 | 6340.03≡ | COMP |
| | 6340.04≡ | 6340.05≡ | 6340.08 | 6340.09 | 6340.11 | 6350.02≡ | 6360.00 | COMP |
| | 6360.00≡ | 6360.01≡ | 6360.01≡ | 6370.00≡ | 6370.00≡ | 6370.01≡ | 6370.01≡ | COMP |
| | 6380.01≡ | 6380.01≡ | 6380.02≡ | 6380.02≡ | 6390.01≡ | 6390.01≡ | 6390.02≡ | COMP |
| | 6390.02≡ | 6400.00 | 6410.00≡ | 6410.01 | 6410.03 | 6410.04 | 6410.06≡ | COMP |
| | 6410.09 | 6430.00 | 6430.01 | 6430.01≡ | 6430.02≡ | 6430.02≡ | 6430.03≡ | COMP |
| | 6430.03≡ | 6430.04≡ | 6430.05≡ | 6430.06 | 6430.06≡ | 6430.07≡ | 6430.07≡ | COMP |
| | 6430.08≡ | 6430.08≡ | 6430.09≡ | 6440.00≡ | 6440.01≡ | 6440.02≡ | 6440.03≡ | COMP |
| | 6440.04≡ | 6440.05≡ | 6440.06≡ | 6440.07≡ | 6450.09≡ | 6450.10 | 6450.10≡ | COMP |
| METRC | .45 | .45≡ | 5130.06≡ | 5130.06≡ | 5360.01≡ | 5360.01≡ | | COMP |
| MX | 5010.03 | 5010.04 | 5080.01 | 5080.02 | 5140.01 | 5140.02 | 5940.01 | COMP |
| | 5940.02 | 6100.01 | 6100.02 | 6310.03≡ | 6310.04 | 6310.05≡ | 6310.11≡ | COMP |
| | 6310.14≡ | 6320.01 | 6320.02≡ | 6320.03≡ | 6320.04 | 6320.04≡ | 6320.05≡ | COMP |
| | 6320.06 | 6320.06≡ | 6320.07≡ | 6320.07≡ | 6320.08≡ | 6320.08≡ | 6320.09≡ | COMP |
| | 6340.00 | 6340.01 | | | | | | COMP |
| N | 5610.01≡ | 5820.06 | 5900.01 | | | | | COMP |
| NC | .47≡ | 5080.00≡ | 5080.03 | 5080.03≡ | 5080.04≡ | 5080.04≡ | 5080.06≡ | COMP |
| | 5080.06≡ | 5130.09 | 5130.09≡ | 5130.10≡ | 5130.10≡ | 5160.01 | 5350.05 | COMP |
| | 5500.01 | 6150.00 | 6160.12≡ | 6160.12≡ | 6280.00 | | | COMP |
| NCPT | 5080.01 | 5140.01 | 5940.01 | 6100.01 | 6100.02 | 6340.00 | | COMP |
| NCYCL | 6150.00 | 6280.00 | | | | | | COMP |
| NDAYS | .48 | | | | | | | COMP |

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NDIV    6450.01  6450.02                                                  COMP
NDIVF   5170.00  5180.00  5190.00                                         COMP
NDIVR   5140.08  5210.00                                                  COMP
NDVSH   6450.11= 6450.11=                                                COMP
NFL        .43= 5230.19= 5230.19= 5440.01  5520.02= 5520.02= 5720.00     COMP
        5730.01  6340.07                                                 COMP
NL         .43  5230.09  5230.12  5230.12  5250.01  5390.00  5400.01     COMP
        5440.02  5440.02  5440.08  5440.09  5500.01  5520.01= 5530.08=    COMP
        5530.08= 5540.06  5580.03  5580.04  5590.01  5610.01  5630.00=    COMP
        5650.02  5670.01  5730.07  5730.08  5730.10  5730.12  5740.01     COMP
        5820.06  5850.07  5850.07= 5900.01  6150.04  6160.14= 6190.02     COMP
        6200.01  6410.00  6410.02                                         COMP
NLF        .43                                                           COMP
NPER       .46= 5020.04  5020.04  5020.05= 5020.05= 5130.12  5130.12=    COMP
        5350.07  5350.07                                                 COMP
NPWR       .53      .54  6130.01  6130.02  6280.01  6300.00              COMP
NPWRS   5440.11  5440.12  5470.04  5470.05  6150.00= 6150.01  6280.04=    COMP
        6280.05= 6310.01= 6310.02                                        COMP
NR      5440.07= 5450.00= 5470.01= 5470.02= 5970.01= 5970.02  6100.06=    COMP
        6100.11  6110.05=                                               COMP
NRESM   5140.03= 5260.01  5420.00  5440.03= 5780.02  5850.00              COMP
NRESP   6150.02  6310.06                                                COMP
NRESR   5140.03  5410.01= 5500.03                                       COMP
NSH2    6430.07= 6430.07=                                                COMP
NSHDV   5020.06= 5020.07                                                 COMP
NSHMN   6430.02= 6430.02=                                                COMP
NSHP    6300.12= 6300.12=                                                COMP
NSHPS   6300.10= 6300.10=                                                COMP
NSHQ    5040.00  5040.01  5050.01                                        COMP
NSHR    5010.01  5010.03                                                 COMP
NSPER   5020.02                                                          COMP
NSRTP   6320.07= 6320.07=                                                COMP
NSTOR   6350.02= 6360.00  6360.00= 6360.01= 6360.01= 6370.00= 6370.00=   COMP
        6370.01= 6370.01= 6380.01= 6380.01= 6380.02= 6380.02= 6390.01=   COMP
        6390.01= 6390.02= 6390.02= 6400.00                               COMP
NUPST   5230.05  5440.07  5580.02  5780.07  5850.10  5850.11  5920.00     COMP
        5920.02  5970.00  5970.01  6100.05= 6100.06                       COMP
OVLOD   6020.06  6300.02                                                  COMP
PFMAX   5450.03  5450.04  5450.04  5470.10  5470.11  5470.11  6160.09     COMP
        6220.08  6230.07  6310.12                                         COMP
PG         .03  5440.13= 5440.15= 5440.17= 5440.18= 5440.18= 5440.21     COMP
        5440.21= 5440.22= 5440.22= 5450.05= 5450.05= 5470.06= 5470.12=   COMP
        5470.12= 6160.15  6160.20  6170.00= 6210.04                       COMP
PGAU       .03  6160.07= 6160.11= 6160.11= 6160.12  6160.12  6190.00     COMP
PGAUT   6160.01= 6190.00=                                                COMP
PGT        .03  6160.00= 6170.01= 6190.03  6190.04  6190.04=             COMP
PKPWR   6090.00                                                          COMP
POWER   6130.07= 6130.08  6130.08= 6130.09  6130.11= 6130.11= 6140.00=   COMP
        6160.07  6160.15  6300.03  6300.03= 6300.04  6300.07  6300.08     COMP
        6310.04  6310.10  6310.11= 6320.01                               COMP
POWR    5000.00  6160.13= 6160.13= 6160.21  6160.21= 6180.02  6220.09     COMP
        6250.05  6300.05  6300.07                                         COMP
POWRP   6020.06  6090.00= 6130.11  6130.11= 6160.08                       COMP
POWRT   6160.03= 6180.02=                                                COMP
PWER    5000.00  5370.02  5370.03  5370.03  6160.12= 6160.12= 6160.13=   COMP
        6160.13= 6180.01  6210.04= 6210.05  6210.07= 6210.07= 6230.00     COMP
        6230.07= 6230.09= 6230.09= 6250.05= 6250.07= 6250.07= 6300.06     COMP
        6300.08  6310.05= 6310.14= 6320.03  6320.05                       COMP
PWERT   6160.02= 6180.01= 6210.00  6210.05= 6220.01                       COMP
PWRMX   5450.03  5450.04  5450.04  5470.10  5470.11  5470.11  6020.06     COMP
        6160.09  6220.08  6230.07  6300.02  6310.12                       COMP
PWRS    6150.03  6230.01  6230.02  6250.00  6320.02  6320.03              COMP
QA      5140.04= 5140.06  5370.05  5370.06= 5410.00  5410.02= 5410.09=    COMP
        5510.00  5610.01= 5650.00  5790.00  5800.01  5800.02  5810.01=    COMP
        5820.06  5860.00  5880.02= 5880.03= 5890.01= 5900.01  5920.05     COMP
        5930.01= 5930.02= 5930.04  5930.05  5930.06= 5980.00  5980.01     COMP
        5980.01= 5990.01  6060.01  6080.02  6080.02  6100.04  6100.04=    COMP
        6100.13  6120.00  6130.06  6130.06= 6130.07  6130.08  6130.08     COMP
        6160.15  6430.00  6430.05  6440.06                               COMP
QASUM   5850.09= 5860.00= 5870.00  5920.01= 5920.05= 5930.01              COMP
QAX     6100.09= 6100.13= 6110.01  6110.02                               COMP
QCAP    5130.08                                                          COMP
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QCONS   5410.00= 5820.00= 5820.00= 5890.02= 5930.07= 6100.04  6100.04= COMP
        6110.00  6110.02  6120.00= 6440.05                             COMP
QCX     6100.10= 6110.00= 6110.01  6110.02                            COMP
QDIV    5020.11  5020.12= 5020.13  5150.04= 5160.00  5200.00  5200.00= COMP
        6450.04  6450.07                                              COMP
QDIVA   5150.03  5150.05= 5200.02= 5210.05  5280.03  5280.03  5410.06  COMP
        5410.07= 5410.08  5530.01  5530.01  5540.04= 5590.08= 5620.07  COMP
        5620.07= 5620.08= 5930.04  5960.00  5960.01  6450.05  6450.07  COMP
QDIVR   5140.07= 5210.05= 5230.11  5230.12  5230.12  5400.00  5410.02  COMP
        5410.03  5410.07  5410.08= 5540.05= 5580.05  5590.09= 5640.02= COMP
        5930.01  5930.05= 5940.04  6110.02                             COMP
QDIVS   5020.11= 5020.13= 5020.14= 5020.14= 5150.03= 5150.05  5200.01= COMP
QI      5180.00  5940.04= 5960.00= 5980.00= 5980.01  5980.01  5990.01  COMP
        6440.02                                                       COMP
QL      5230.02  5230.11  5230.12  5230.12  5400.00  5410.02  5410.03= COMP
        5410.07  5580.05  5730.05  5930.01  5940.03  5940.04  6110.02  COMP
        6440.00                                                       COMP
QLKG    5230.21= 5230.21= 5280.04  5370.02  5370.03  5370.03  5450.03  COMP
        5450.04  5450.04  5470.10  5470.11  5470.11  5520.00  5520.00= COMP
        5530.02  5620.02  5620.03  5620.03  6130.05  6130.07  6130.08  COMP
        6130.08  6160.15                                              COMP
QM2     6430.04=                                                      COMP
QMAXA   5080.03  5080.03= 5130.09  5130.09= 5130.10= 5130.10= 5230.00  COMP
        5530.04  5530.04= 5530.05= 5590.03  5590.03= 5730.04  5730.04= COMP
QMIN2   5050.03  5050.03= 5690.00  6430.05  6440.03                    COMP
QMINA   5040.03  5040.04  5040.04  6430.00  6440.04                    COMP
QMINS   5040.03  5040.04  5040.04= 5050.03  5050.03= 5140.04           COMP
QMX     5230.01  5230.01= 5590.02  5730.03                            COMP
QO      5400.00= 5400.01  5400.02  5440.10  5440.13  5440.17  5550.00= COMP
        5630.02  5630.02=                                             COMP
QOMN    5400.01= 5400.03  5440.15  5440.18  5440.18= 5440.20  5470.00  COMP
        5470.00  5620.12= 5620.12= 5820.01= 5820.02= 5820.02= 5820.03= COMP
        5820.03= 5870.00=                                             COMP
QOMNA       .04  5400.02= 5620.10= 5820.02  5820.02=                   COMP
QOMNB       .04  5400.03= 5620.11= 5620.12  5620.12= 5820.03= 5820.03= COMP

QOMNA       .04  5400.02= 5620.10= 5820.02  5820.02=                   COMP
QOMNB       .04  5400.03= 5620.11= 5620.12  5620.12= 5820.03= 5820.03= COMP

QOMNA       .04  5400.02= 5620.10= 5820.02  5820.02=                   COMP
QOMNB       .04  5400.03= 5620.11= 5620.12  5620.12= 5820.03= 5820.03= COMP
QOT     5230.17  5230.22= 5260.05  5440.10  5470.00  5470.00= 5490.00  COMP
        5510.00= 5520.00= 5520.00= 5520.02= 5520.02= 5520.03= 5520.03= COMP
        5520.04= 5520.04= 5530.03  5530.03= 5530.04= 5530.04= 5530.06= COMP
        5530.06= 5530.08= 5530.08= 5540.00= 5540.03  5550.01= 5560.00  COMP
        5560.00= 5580.05= 5590.00= 5590.04= 5590.07  5590.10= 5610.01= COMP
        5620.02  5620.03  5620.03  5630.01= 5640.01  5640.01= 5640.03  COMP
        5640.03= 5650.03  5660.01  5690.02= 5690.03  5730.08  5730.10  COMP
        5730.13  5750.01  5750.02  5750.02  5780.05  5820.06  5850.06  COMP
        5850.07  5850.07  5900.01                                      COMP
QOTMN       .04  5080.04= 5080.04= 5230.19  5230.19= 5230.20= 5230.20= COMP
        5280.04= 5520.02= 5520.02= 5530.06= 5530.06= 5820.04= 5820.04= COMP
        5820.06  5850.08  5870.01= 5900.01                             COMP
QOTMX       .04  5230.02= 5230.03  5230.03= 5230.04= 5230.04= 5230.18  COMP
        5230.18= 5240.01  5240.03  5240.03  5260.05= 5520.03= 5520.03= COMP
        5530.08= 5530.08= 5540.00= 5540.03  5550.01  5640.03= 5640.03= COMP
        5820.06  5900.01                                              COMP
QPREP   5170.00  5940.03= 5970.04= 6440.01                            COMP
QT      5300.01  5300.02= 5330.00  5330.01                            COMP
RSHDV   5020.13                                                       COMP
RSHQ    5040.04  5040.04                                              COMP
RTIOD   5150.03  5150.04  6450.06=                                     COMP
SHDIV   6450.03= 6450.07= 6450.08= 6450.08= 6450.10  6450.10= 6450.11= COMP
        6450.11= 6450.12= 6450.12= 6450.13                            COMP
SHDMX   6450.12= 6450.12=                                             COMP
SHMX    6430.03= 6430.03=                                             COMP
SHMX2   6430.08= 6430.08=                                             COMP
SHPMX   6300.13= 6300.13=                                             COMP
SHRT2   6430.05= 6430.06= 6430.06= 6430.07= 6430.07= 6430.08= 6430.08= COMP
        6430.09                                                       COMP
SHRTP   6300.07= 6300.12= 6300.12= 6300.13= 6300.13= 6300.14= 6300.14= COMP
        6300.17  6310.00  6320.03= 6320.04= 6320.04= 6320.06= 6320.06= COMP
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        6320.07= 6320.07= 6320.08= 6320.08= 6320.09                          COMP
SHRTQ   6430.00  6430.01  6430.01= 6430.02= 6430.02= 6430.03= 6430.03= COMP
        6440.07                                                              COMP
SPSMX   6300.11= 6300.11=                                                    COMP
STOR    5080.09  5080.10  5130.01  5130.02  5130.02  6000.03  6000.04  COMP
        6020.01  6020.02  6020.02                                           COMP
STORA   5020.00  5080.06  5080.06  5230.12  5230.12  5400.00  5990.01  COMP
        6000.00  6340.05= 6340.11  6410.01                                 COMP
STORB   5990.01= 5990.02= 5990.03  5990.04= 6000.00  6000.03  6020.02  COMP
        6020.02  6340.05                                                   COMP
STORL   5230.12  5230.12  5400.00  6340.08  6340.09  6410.03  6410.04  COMP
STRAV   5080.06= 5080.06= 5080.09  5130.02  5130.02  5190.00  6000.00= COMP
        6030.01  6050.02  6050.02                                          COMP
STRSH   5020.01                                                          COMP
SYCNS   6440.05=                                                         COMP
SYDV    6450.04=                                                         COMP
SYDVA   6450.05=                                                         COMP
SYDYS       .49                                                          COMP
SYEVP   6340.04=                                                         COMP
SYMSP   6320.08= 6320.08=                                                COMP
SYPR    6300.05= 6320.02=                                                COMP
SYPRE   6440.01=                                                         COMP
SYPWR   6300.04= 6320.01                                                 COMP
SYQ     6440.04=                                                         COMP
SYQA    6440.06=                                                         COMP
SYQI    6440.02=                                                         COMP
SYQL    6440.00=                                                         COMP
SYQMN   6440.03=                                                         COMP
SYSH2   6430.09=                                                         COMP
SYSHD   6450.13=                                                         COMP
SYSHP   6310.00= 6320.09=                                                COMP
SYSHQ   6440.07=                                                         COMP
SYSP    6300.06= 6320.05=                                                COMP
SYSSP   6300.08= 6300.09= 6300.09= 6300.10= 6300.10= 6300.11= 6300.11= COMP
        6300.18                                                          COMP
SYSYS   6300.18=                                                         COMP
TEMP    5010.02= 5020.00= 5020.01  5130.00= 5130.02= 5130.02= 5130.03  COMP
        5130.08  5130.11  5130.16  5160.00= 5170.00  5180.00  5190.00  COMP
        5200.00  5200.00= 5200.01  5200.02  5230.00= 5230.01  5230.01= COMP
        5230.02  5230.04  5230.04  5230.08= 5230.10  5230.11= 5230.12  COMP
        5230.12= 5230.23= 5240.01  5240.02  5240.02= 5240.03= 5240.03= COMP
        5330.01= 5330.02  5350.02= 5350.03  5350.03= 5360.02= 5360.02= COMP
        5450.03= 5450.04  5450.04= 5450.05= 5450.05= 5470.10= 5470.11  COMP
        5470.11= 5470.12= 5470.12= 5530.00= 5530.01  5530.01= 5530.02= COMP
        5530.03  5530.03= 5540.03= 5540.04  5540.05  5550.00  5590.07= COMP
        5590.08  5590.09  5620.05= 5620.07  5620.07= 5620.08  5620.10  COMP
        5620.11  5630.01  5630.02  5630.02  5640.02  5650.00= 5650.03  COMP
        5660.01  5730.00= 5730.02  5730.02= 5730.05= 5730.08  5730.10  COMP
        5730.13  5750.02  5750.02  5780.05= 5780.06  5800.01  5800.02  COMP
        5810.01  5820.00  5820.00= 5820.04= 5820.04= 5850.06= 5850.07  COMP
        5850.07= 5850.08= 5870.00  5870.01  5880.02  5880.03  5890.01  COMP
        5890.02  5940.05= 5960.01= 5980.01  5980.01  5990.01  6020.00= COMP
        6020.02= 6020.02= 6020.03  6050.00= 6050.02  6050.02= 6080.00= COMP
        6080.02  6080.02= 6090.00  6100.07= 6100.08  6100.08= 6110.02  COMP
        6130.05= 6130.06  6130.06= 6160.09= 6160.10  6160.10= 6160.15= COMP
        6160.16  6160.16= 6160.22= 6160.22= 6170.00  6170.01  6190.01= COMP
        6190.04  6190.04= 6190.05= 6190.05= 6210.04  6220.04= 6230.00= COMP
        6230.01  6230.02  6250.00  6300.02= 6300.03  6300.03= 6310.10= COMP
        6310.11  6310.13  6310.13= 6310.14  6340.09= 6340.10  6340.11  COMP
        6410.03= 6410.05  6410.07= 6410.09                               COMP
TL      5330.02  5340.00                                                  COMP
TLWEL   5280.08  5280.10  5350.02  5370.08=                               COMP
TMP     5020.01= 5020.12  5020.13  5040.04  5040.04= 5130.04= 5130.05  COMP
        5130.05= 5130.06= 5130.06= 5130.07  5130.08= 5130.09  5130.09  COMP
        5130.10  5130.10  5230.10= 5240.02  5240.02= 5240.03= 5240.03= COMP
        5280.02= 5280.03  5280.03= 5280.04  5410.06= 5410.07  5410.08  COMP
        5590.02= 5590.03  5590.03= 5590.04= 5590.07  5590.10  5620.02= COMP
        5620.03  5620.03= 5620.04= 5620.05  5660.00= 5660.01  5690.00= COMP
        5690.01  5690.01= 5690.03  5720.01= 5720.02  5730.03= 5730.04  COMP
        5730.04= 5730.05  5730.06= 5750.00= 5750.02  5750.02= 5760.00= COMP
        5760.00= 5760.01= 5770.00= 5780.01  5780.05  5850.04= 5850.05= COMP
        5850.07  5850.07  6110.02= 6110.03  6110.04  6110.04= 6120.00  COMP
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         7590.07= 7590.08  7590.09  7600.01  7630.03= 7630.06= 7630.07  ECON
         7630.08  7640.01  7670.03= 7670.06  7670.07  7680.01  7710.03= ECON
         7710.06  7710.07  7720.01                                      ECON
MTH      7130.10= 7130.12  7130.13  7130.15  7130.16  7130.18  7140.02  ECON
         7140.04                                                       ECON
MX       7090.01  7090.02  7130.02  7130.03  7250.01  7250.02  7540.04  ECON
         7540.05  7590.02  7590.03  7630.02  7630.03  7670.02  7670.03  ECON
         7710.02  7710.03                                              ECON
NCPT     7090.01  7130.02  7250.01  7540.04  7590.02  7630.02  7670.02  ECON
         7710.02                                                       ECON
NEA      7120.01= 7500.01  7500.01= 7510.01                            ECON
NL       7080.01= 7080.02  7130.13  7130.15  7130.16  7130.18  7130.20  ECON
         7140.06  7300.01  7310.01                                      ECON
NPFR     7130.11  7210.02  7240.01  7260.00  7260.01  7290.00  7290.02  ECON
         7290.02  7300.00  7380.01  7400.01  7430.02  7470.02           ECON
NRESR    7250.03  7430.00                                              ECON
NYRS     7170.01  7200.00  7540.02                                      ECON
O            .02  7290.00  7290.02  7290.02  7300.03  7330.02  7330.02  ECON
         7380.02=                                                      ECON
OII      7260.00  7440.00                                              ECON
SM           .02  7250.00= 7340.04= 7360.02= 7470.02  7540.00= 7540.10= ECON
         7560.01  7590.00= 7590.08= 7610.01  7630.00= 7630.07= 7650.01  ECON
         7670.00= 7670.06= 7690.01  7710.00= 7710.06= 7730.01           ECON
SUM      7270.03= 7340.03= 7360.01= 7400.02  7420.00  7540.06= 7540.11= ECON
         7550.01  7560.00  7590.04= 7590.09= 7600.01  7610.00  7630.04= ECON
         7630.08= 7640.01  7650.00  7670.04= 7670.07= 7680.01  7690.00  ECON
         7710.04= 7710.07= 7720.01  7730.00                            ECON
SUMA     7240.00= 7420.00= 7480.01  7540.01= 7560.00= 7560.01  7590.01= ECON
         7610.00= 7610.01  7630.01= 7650.00= 7650.01  7670.01= 7690.00= ECON
         7690.01  7710.01= 7730.00= 7730.01                            ECON
TEMP     7170.01= 7170.02                                              ECON
TMP      7130.19= 7130.21  7130.21= 7140.01  7140.05  7330.00= 7330.02= ECON
         7330.02= 7330.03  7540.02= 7540.03= 7540.09  7590.06  7590.07  ECON
TMPP     7330.03= 7340.00  7340.01  7340.02  7340.03  7340.04  7340.05  ECON
         7350.00  7360.00  7360.01  7360.02  7360.03  7360.04  7440.02  ECON
TMPX     7260.01  7380.02                                              ECON
V            .02  7130.04= 7340.00= 7360.03= 7440.00= 7440.01= 7590.06= ECON
         7590.08  7590.09  7600.01  7630.06= 7630.07  7630.08  7640.01  ECON
VLFFT        .02  7130.07= 7170.02  7340.05= 7590.07= 7630.06  7710.06  ECON
         7710.07  7720.01                                              ECON
VMAX         .03  7130.06= 7140.01  7140.05= 7170.02  7630.06  7670.06  ECON
         7670.07  7680.01                                              ECON
VU           .03  7130.05= 7340.01= 7360.04= 7540.09= 7540.10  7540.11  ECON
         7550.01                                                       ECON
J            .01      .03  9600.02  9630.00  9630.01                   INTPOL
L            .04= 9600.01= 9600.02  9620.00  9630.00  9630.01           INTPOL
L1           .05= 9620.00= 9630.00  9630.01                            INTPOL
LL       9600.00  9600.01                                              INTPOL
NVAL         .01  9600.00                                              INTPOL
TEMP         .01      .03  9600.02  9630.00                           INTPOL
TMPP         .01  9630.00=                                             INTPOL
VAR1         .01      .02      .03  9600.02  9630.00                   INTPOL
VAR2         .01      .02  9630.00  9630.01                            INTPOL
APERD    8450.02  8480.00= 8510.01=                                    REARNG
APRD     8450.02  8480.00= 8510.01=                                    REARNG
ARRAY    8240.06  8260.06  8260.08  8260.09=                          REARNG
AVG      8240.06= 8260.05  8260.06=                                    REARNG
*RINTP   8030.01  8060.01  8090.01  8120.01  8150.01  8180.01  8210.02  REARNG
         8240.01  8240.01  8320.01                                      REARNG
CPT      8380.01                                                       REARNG
ELEV     8430.01  8450.02  8480.00  8510.01                           REARNG
EVP      8430.01  8450.03= 8480.01= 8510.02                           REARNG
I        8260.07  8260.08  8260.09= 8380.01  8440.06  8440.07= 8450.02  REARNG
         8450.03= 8480.00= 8480.01= 8510.00= 8510.01= 8510.02          REARNG
I1       8030.00  8050.01  8050.02  8050.03=                          REARNG
I10      8360.00  8360.00  8360.07                                     REARNG
I2       8060.00  8080.01  8080.02  8080.03=                          REARNG
I3       8090.00  8110.01  8110.02  8110.03=                          REARNG
I4       8120.00  8140.01  8140.02  8140.03=                          REARNG
I5       8150.00  8170.01  8170.02  8170.03=                          REARNG
I6       8180.00  8200.01  8200.02  8200.03=                          REARNG
I7       8210.01  8230.01  8230.02  8230.03= 8240.01  8240.01         REARNG
```

```
I8        8240.00  8310.01  8310.02  8310.03=                                    REARNG
I9        8320.00  8340.01  8340.02  8340.03=                                    REARNG
ICND      8010.02= 8030.01  8060.01  8090.01  8120.01  8150.01  8180.01  REARNG
          8210.02  8240.01  8240.01  8320.01                                     REARNG
ICPT      8240.04  8260.03  8360.04                                             REARNG
IONE      8110.01  8140.01                                                      REARNG
IPWKW     8390.01  8440.03                                                      REARNG
IPWR      8370.00  8440.01  8440.02                                             REARNG
IRES      8240.05  8260.04  8360.05                                             REARNG
ITWO      8340.01                                                              REARNG
IYEAR     8360.06= 8430.03  8530.00=                                           REARNG
IYR       8360.06                                                              REARNG
IZERO     8050.01  8080.01  8170.01  8200.01  8230.01  8310.01                 REARNG
J         8240.02  8240.06= 8260.01  8260.05  8260.06= 8260.08  8260.09= REARNG
          8430.00                                                              REARNG
JONE      8110.01  8140.01  8170.01  8200.01                                    REARNG
JTWO      8340.01                                                              REARNG
JZERO     8050.01  8080.01  8230.01  8310.01                                    REARNG
K         8440.02= 8440.04= 8440.05= 8440.07= 8450.01= 8450.03= 8460.01  REARNG
          8480.01= 8490.01                                                     REARNG
KCPT      8030.01  8060.01  8150.01  8180.01                                    REARNG
KDIV      8090.01  8120.01                                                      REARNG
KONE      8110.01  8140.01                                                      REARNG
KRES      8210.02  8240.01  8240.01  8320.01                                    REARNG
KTWO      8340.01                                                              REARNG
KZERO     8050.01  8080.01  8170.01  8200.01  8230.01                          REARNG
M         8240.04= 8240.05  8240.06= 8260.03= 8260.04  8260.05  8260.06= REARNG
          8260.08  8260.09= 8360.04= 8360.05  8370.00  8380.01  8440.01  REARNG
          8440.02  8450.02  8450.03= 8460.01= 8480.00  8480.01= 8490.01= REARNG
          8510.01  8510.02  8520.01                                           REARNG
MX        8240.03  8240.04  8260.02  8260.03  8360.03  8360.04                REARNG
NCPT      8240.03  8260.02  8360.03                                           REARNG
NFMT      8310.01                                                            REARNG
NPER      8240.06  8260.06  8260.07  8440.06  8450.03  8480.01  8510.00= REARNG
NRES      8210.00  8210.00                                                    REARNG
NYRS      8010.03  8010.04= 8240.02  8260.01  8430.00                        REARNG
*OUTPT    8050.01  8080.01  8110.01  8140.01  8170.01  8200.01  8230.01  REARNG
          8310.01  8340.01                                                    REARNG
POWER     8430.01  8440.07= 8450.03= 8480.01=                                 REARNG
POWRP     8430.02  8450.03=                                                   REARNG
QA        8430.02  8450.03= 8480.01= 8510.02                                  REARNG
QI        8430.01  8450.02  8480.00  8510.01                                  REARNG
QUNIT     8040.01  8070.01  8100.01  8130.01  8160.01  8190.01                REARNG
SHRTP     8430.01                                                            REARNG
STORB     8430.01  8450.02  8480.00= 8510.01                                  REARNG
SYEVP     8430.01  8460.01= 8490.01  8520.01                                  REARNG
SYPMX     8430.01  8460.01                                                    REARNG
SYPWR     8430.01  8440.04= 8450.01= 8460.01  8490.01                        REARNG
SYQA      8430.02  8460.01= 8490.01= 8520.01                                  REARNG
SYQI      8430.01  8460.01= 8490.01= 8520.01                                  REARNG
SYSHP     8430.01  8440.05=                                                   REARNG
TEMP      8260.08= 8260.09  8260.10                                           REARNG
TITLE     8040.00  8070.00  8100.00  8130.00  8160.00  8190.00  8220.00  REARNG
          8300.00  8330.00  8360.01                                           REARNG
TMP       8260.05= 8260.06  8260.09  8260.10=                                 REARNG
VUNIT     8220.01  8300.01                                                    REARNG
ARRAY     9100.01  9110.00                                                    BINTP
AVG       9100.01                                                            BINTP
I           .08    9000.00= 9000.02  9000.03  9000.05= 9030.00  9030.01  BINTP
          9040.02= 9050.01= 9060.01  9060.03  9070.01  9070.01= 9080.00= BINTP
          9100.00                                                            BINTP
ICND        .01      .07    9060.02  9080.03  9140.01=                       BINTP
ID        9000.01= 9000.04= 9000.05  9010.02= 9010.03  9020.01= 9020.02  BINTP
          9060.01                                                            BINTP
ION       9060.00= 9060.04  9060.04= 9070.01  9070.01= 9080.04                BINTP
IONN      9060.01= 9120.00  9120.01                                          BINTP
IND         .02    9000.00= 9000.05= 9010.03= 9020.02= 9030.01  9040.01  BINTP
          9050.00  9050.00  9060.01  9060.04  9060.04= 9080.00=             BINTP
IRG       9000.03  9010.01  9020.00= 9030.01= 9040.01  9050.00  9050.00  BINTP
          9060.04  9060.04= 9070.01  9070.01=                                BINTP
J         9060.03  9060.04  9060.04= 9080.02  9100.01  9110.00              BINTP
K         9080.04  9100.01  9110.00  9120.01                                BINTP
```

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LMT        .01   9100.01  9110.00                                          BINTP
M       9100.01  9110.00                                                   BINTP
NPER    9100.01  9110.00                                                   BINTP
NYRS    9080.02                                                           BINTP
ANYRS   9260.01= 9400.00  9410.01                                          OUTPT
APERD   9310.01  9440.03                                                  OUTPT
APRD    9310.01  9440.03                                                  OUTPT
ARRAY   9360.04  9370.00  9480.00  9490.01                                OUTPT
AVE        .02   9360.00= 9370.00= 9400.00= 9410.00                       OUTPT
AVG     9370.02  9370.03  9480.02  9490.02                                OUTPT
CPT     9310.00                                                           OUTPT
I       9310.01  9350.00  9360.00= 9360.04  9360.06  9370.00= 9390.02    OUTPT
        9400.00= 9410.00  9440.03  9480.00  9490.01                       OUTPT
*IABS   9310.04  9310.04  9490.00                                         OUTPT
ICPT    9270.01  9440.07  9490.01                                         OUTPT
IDIV    9280.00  9310.04  9310.04  9450.00  9490.00                       OUTPT
IFMT       .01      .02   9360.04  9480.00  9490.01                       OUTPT
IND        .01  9260.02                                                   OUTPT
IRES    9290.00  9460.00                                                  OUTPT
ITST       .01  9270.02  9310.02  9310.03  9310.04  9310.04= 9370.01    OUTPT
        9390.01  9410.02  9440.04  9440.05  9440.08  9480.01             OUTPT
IYEAR   9360.02= 9360.04  9360.05= 9440.00= 9440.02  9510.01=            OUTPT
IYR     9360.02  9440.00                                                  OUTPT
J       9360.03  9360.04  9370.00  9370.02  9370.03  9440.01  9480.00    OUTPT
        9480.02  9490.01  9490.02                                         OUTPT
JFMT       .01      .02   9370.02  9410.03  9480.02  9490.02             OUTPT
K       9310.00                                                          OUTPT
KFMT       .01      .02   9410.00                                         OUTPT
M       9270.01= 9280.00  9290.00  9300.00  9310.00  9310.04  9310.04=  OUTPT
        9360.04  9370.00  9370.02  9370.03  9440.07= 9450.00  9460.00    OUTPT
        9470.00  9480.00  9480.02  9490.00= 9490.01  9490.02             OUTPT
MX      9270.00  9270.01  9440.06  9440.07  9490.01                       OUTPT
NCPT    9270.00  9440.06                                                  OUTPT
NPER    9310.01  9350.00  9360.04  9360.06  9390.02  9410.00  9440.03    OUTPT
        9480.00  9490.01                                                  OUTPT
NYRS    9260.01  9360.03  9440.01                                         OUTPT
QM2     9300.00  9470.00                                                  OUTPT
TAVE    9360.01= 9370.03= 9410.01= 9410.03                                OUTPT
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# EXHIBIT 4

# PROGRAM LISTING

```
C      HEC-5  RESERVOIR SYSTEM ANALYSIS   723-X6-L2030  JULY 1974                1000
C                TAPE 1-4    =  SCRATCH FILES                                     1001
C                TAPE 5      =  CARD READER                                       1002
C                TAPE 6      =  LINE PRINTER                                      1003
C      INDEXES I=PER J=YEAR K=TABLE L=LEVEL M=LOCATION IP=PWR ID=DIV              1004
       COMMON/DTADM/                                                             1005
      . KCPT,KPWR,KPWRS,KRES,KUPST,KDIV,KL,KPER,KQIL,KSERV,KUPQI                 1006
       COMMON/DTAIN/                                                             1007
      . PUNIT(6),BLNK,IBLK,FLWU,VOLU,FLMT,VLMT,AMOS(12),KDAYS(12),               1008
      . INUM(10),LTRJ,LTRC,IKODE(24),KODE(13),FIRST,LTDP                         1009
       COMMON/DTARG/                                                             1010
      . IZERO(3),IONE(3),ITWO(3),JZERO(3),JONE(3),JTWO(3),                       1011
      . KZERO(3),KONE(3),KTWO(3),NFMT(3)                                         1012
       COMMON/IN/                                                                1013
      . CACFT,CCFS,CSTI(12),CSTO(12),DINDX(25),IFLOW,IPRL,IPRNT,                 1014
      . IPWYR,ISERV(30,19),ISMRY,ISTOR(12),IUNIT,IUPDT,                          1015
      . IUPQI(40,10),IYR,JUPQI,MQ(90),NDVYR,NFLOW,NLYR,NSERV(30),                1016
      . NQYR,NUPQI(40),PINDX(22),QINDX(40),QMIN(12,40),Q2NDX(40),                1017
      . RTIO(90),SCNS(40),SDV(25),SDVA(25),SEVP(30),SPMX(22),SPR(22),            1018
      . SPRE(40),SPWR(22),SQ(40),SQA(40),SQI(40),SQL(40),SQMN(40),               1019
      . SSHD(25),SSHP(22),SSHQ(40),SSH2(40),SSP(22),STOR1(30),TMPR(12)           1020
      . ,CSOUT(12)                                                               1020.1
       COMMON /ALPHA/                                                            1021
      . APERD(12),APRD(12),IDIV(40),IPWR(40),IYR1,NPWR,NRES,QM2(40),             1022
      . TITLE(60),IPWKW                                                          1023
       COMMON /BETA/                                                             1024
      . NYRS,IRG(10),CPT(40,8),ICPT(40),IRES(40),NCPT,NPER,QUNIT,VUNIT           1025
       COMMON/DLTA1/                                                             1026
      . CNTRL(12,40),QL(12,40),SYQI(40),QI(12,40),STORB(12,30),                  1027
      . ELEV(12,30),SYEVP(30),EVP(12,30),SYPWR(22),POWER(12,22),                 1028
      . SYSHP(22),SHRTP(12,22),SYPMX(22),POWRP(12,20),SYQA(40),QA(12,40)         1029
       COMMON/DLTA2/                                                             1030
      . ANDYS,AREA(30,10),CEVAP(30),CFLOD,CLOCL,CONST,CQOEL(20,10),              1031
      . EFCY(30,10),EFFCY(20),EFY(20),EL(30,10),EVAPQ(12),HEAD(20),ICONS,        1032
      . ICSE(12,40),IDBAS(25),IDGST,IDPR(20),IDV(25),IDVPR,IDVSP,IEVYR,          1033
      . IPER(12),IPERA,IPOW(20),IPR(20),IPRN(40),IPWPR,IRESP(2,20),              1034
      . ISHDV(25),ISHQ(40),ISHR(30),ISPER,ISRCH(40),ISYSR(40),                   1035
      . IUPST(40,18),METRC,NCYCL,NDAYS(12),NDIV,NDIVR(40),NDVSH(25),             1036
      . NFLW(40),NL,NLF,NPWRS,NRESM,NRESP(2),NSH2(40),NSHDV,NSHMN(40),           1037
      . NSHP(40),NSHPS(40),NSHQ,NSHR,NSPER,NSRTP(2),NUPST(40),QVLOD(20)          1038
       COMMON/DLTA3/                                                             1039
      . PFMAX(20),PKPWR(20,10),POWR(12,20),PWER(12,22),PWRMX(20),                1040
      . PWRS(12,2),          QCAP(30,10),QCONS(12,40),QDIV(12,25),               1041
      . QDIVA(12,25),QDIVR(40),QDIVS(12,25),QLKG(40),QMAXA(40),                  1042
      . QMIN2(12,40),QMINA(12,40),QMINS(12,40),QMX(12,40),QO(30,8),              1043
      . QOMN(30),QOT(40,8),          QPREP(12,40),QT(20,10),RSHDV,RSHQ,          1044
      . RTIOD(25),SHDIV(12,25),SHDMX(25),SHMX(40),SHMX2(40),SHPMX(40),           1045
      . SHRT2(12,40),SHRTQ(12,40),SPSMX(40),STOR(30,10),STORA(30),               1046
      . STRAV(30),STRSH,SYCNS(40),SYDV(25),SYDVA(25),SYDYS,SYMSP(2),             1047
      . SYPR(22),SYPRE(40),SYQ(40),SYQL(40),SYQMN(40),SYSH2(40),                 1048
      . SYSHD(25),SYSHQ(40),SYSP(22),SYSSP(12,20),SYSYS(22),TL(20,10),           1049
      . TLWEL(20),                                                               1050
      . IDIVF(40),NDIVF(40),IDCPT(40),IDSHT(40),DFUNC(20,40),DPARA(20,40)        1051
       COMMON /BALT/                                                             1052
      . IECON,IE(8,40),IYEAR,NRESR(40),NSTOR(12,40,10),QII(12,40),               1053
      . STORL(12,40,8),TMPP(40),TMPX(12)                                         1054
       COMMON /GAMMA/                                                            1055
      . IRESM(40,30),IDIVR(40,25), IEV(40)                                       1056
C      WRITE FORMATS                                                             1057
C                                  BRANCH TO  1000 FROM  1200.00                 1058
 1000 FORMAT(1H1)                                                               1059
C                                  BRANCH TO  1010 FROM  2040.01  2710.04        1060
C                                      2710.06                                   1061
 1010 FORMAT(1H )                                                               1062
C                                  BRANCH TO  1020 FROM  2980.03  2980.07        1063
 1020 ITRNS =0                                                                  1064
       IPNT=1                                                                   1065
       REWIND 1                                                                 1066
       REWIND 3                                                                 1067
       REWIND 4                                                                 1068
C =A=    INITIATE SYSTEM AND SUMMARY VARIABLES                                 1069
       DO 1030 M=1,KRES                                                         1070
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 1030 STOR1(M)=0.                                                        1071
      DO 1060 M=1,KCPT                                                   1072
      IEV(M)=0                                                           1073
      DO 1040 K=1,KRES                                                   1074
      IRESM(M,K)=0                                                       1075
 1040 CONTINUE                                                           1076
      DO 1050 K=1,KUPST                                                  1077
      IUPST(M,K)=0                                                       1078
 1050 CONTINUE                                                           1079
      DO 1060 K=1,KPER                                                   1080
      DO 1060 L=1,10                                                     1081
      NSTOR(K,M,L)=0                                                     1082
 1060 CONTINUE                                                           1083
C                                BRANCH TO  1070 FROM  2690.01          1084
 1070 DO 1080 M=1,KCPT                                                   1085
      NSHMN(M)=0                                                         1086
      NSH2(M)=0                                                          1087
      NSHP(M)=0                                                          1088
      NSHPS(M)=0                                                         1089
      SHMX(M)=0.                                                         1090
      SHMX2(M)=0.                                                        1091
      SHPMX(M)=0.                                                        1092
      SPSMX(M)=0.                                                        1093
      QINDX(M) = 0.                                                      1094
      Q2NDX(M) = 0.                                                      1095
      SQL(M) = 0.                                                        1096
      SPRE(M) = 0.                                                       1097
      SQI(M) = 0.                                                        1098
      SQMN(M) = 0.                                                       1099
      SCNS(M) = 0.                                                       1100
      SQA(M) = 0.                                                        1101
      SSHQ(M) = 0.                                                       1102
      SSH2(M) = 0.                                                       1103
      SQ(M) = 0.                                                         1104
      QLKG(M)=0.                                                         1105
C                                BRANCH TO  1080 FROM  1070.00          1106
 1080 TMPP(M) = 0.                                                       1107
      DO 1100 M=1,KRES                                                   1108
      SEVP(M)=0.                                                         1109
      DO 1090 I=1,KPER                                                   1110
      EVP(I,M)=0.                                                        1111
C                                BRANCH TO  1090 FROM  1080.03          1112
 1090 CONTINUE                                                           1113
C                                BRANCH TO  1100 FROM  1080.01          1114
 1100 CONTINUE                                                           1115
      ITMP=KPWR+KPWRS                                                    1116
      DO 1110 IP=1,ITMP                                                  1117
      SPWR(IP) = 0.                                                      1118
      SSP(IP)=0.                                                         1119
      SSHP(IP) = 0.                                                      1120
      SPR(IP) = 0.                                                       1121
      SPMX(IP)=99999999.                                                 1122
C                                BRANCH TO  1110 FROM  1100.02          1123
 1110 PINDX(IP) = 0.                                                     1124
      DO 1120 ID=1,KDIV                                                  1125
      NDVSH(ID)=0                                                        1126
      SHDMX(ID)=0.                                                       1127
      SDVA(ID) = 0.                                                      1128
      SSHD(ID) = 0.                                                      1129
      SDV(ID) = 0.                                                       1130
C                                BRANCH TO  1120 FROM  1110.01          1131
 1120 DINDX(ID) = 0.                                                     1132
      DO 1130 IX=1,KPWRS                                                 1133
      NSRTP(IX)=0                                                        1134
C                                BRANCH TO  1130 FROM  1120.01          1135
 1130 SYMSP(IX)=0.                                                       1136
      IF(ITRNS.EQ.1) GO TO 1210                                          1137
C                                BRANCH TO  1140 FROM  2780.01          1138
 1140 DO 1160 M=1,KCPT                                                   1139
      DO 1150 I=1,8                                                      1140
      IE(I,M)=0                                                          1141
C                                BRANCH TO  1150 FROM  1140.01          1142
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 1150 CONTINUE                                                          1143
      NRESR(M)=-1                                                       1144
      NDIVR(M) = 0                                                      1145
      IDIVF(M)=0                                                        1146
      NDIVF(M)=0                                                        1147
      IDCPT(M)=0                                                        1148
      IDSHT(M)=0                                                        1149
      IDIV(M)=0                                                         1150
      ICPT(M)=0                                                         1151
      ISYSR(M)=0                                                        1152
      QM2(M)=0.                                                         1153
      NFLW(M)=0                                                         1154
C                                  BRANCH TO  1160 FROM  1140.00        1155
 1160 IRFS(M)=0                                                         1156
C =B= **********                                                       1157
      CALL INOUT                                                        1158
C     **********                                                       1159
      REWIND 4                                                          1160
      IYR1=IYR                                                          1161
      IYEAR=IYR                                                         1162
      DO 1170 IP=1,NPWR                                                 1163
 1170 EFY(IP)=EFFCY(IP)                                                 1164
C     READ PERIOD DATA                                                  1165
      NCYCL=2                                                           1166
      DO 1180 I=1,NPER                                                  1167
      IF (EVAPO(I).GT..01) GO TO 1190                                   1168
C                                  BRANCH TO  1180 FROM  1170.02        1169
 1180 CONTINUE                                                          1170
      NCYCL=1                                                           1171
C                                  BRANCH TO  1190 FROM  1170.03        1172
 1190 IF(NPWR.LE.0) GO TO 1200                                          1173
      NCYCL=2                                                           1174
      IF(NPWRS.GT.0) NCYCL=3                                            1175
C                                  BRANCH TO  1200 FROM  1190.00        1176
 1200 IF(IFLOW.GT.0)WRITE(6,1000)                                       1177
C =C=       START ROUTING COMPUTATION * * * * * * * * * * * * * * * *  1178
      CFLOW=1.                                                          1179
C                                  BRANCH TO  1210 FROM  1130.01        1180
 1210 REWIND 2                                                          1181
      SHORT=0.                                                          1182
      SRPLS=.5                                                          1183
      TFLOW=-1.                                                         1184
      DO 1220 M=1,KRES                                                  1185
      STORA(NPER,M)=STOR1(M)                                            1186
C                                  BRANCH TO  1220 FROM  1210.04        1187
 1220 STORA(M)=STOR1(M)                                                 1188
      DO 2640 J=1,NYRS                                                  1189
      IF(IPNT.GT.0) WRITE (6,1230)IYR                                   1190
 1230 FORMAT (/22H1ANNUAL INPUT DATA FOR I5/10H **INFLOWS)              1191
      DO 1270 MX=1,NFLOW                                                1192
C                                          **CARD IN**                 1193
      READ(2,1240) M,(QII(I,M),I=1,12)                                  1194
C                                  BRANCH TO  1240 FROM  1350.02  1470.02 1195
 1240 FORMAT(2X,I4,2X,12F6.0)                                           1196
      IF(NPER.GT.12) READ(2,1250)(QII(I,M),I=13,NPER)                   1197
C                                  BRANCH TO  1250 FROM  1280.00  1310.04 1198
C                                      1390.02  1430.02                1199
 1250 FORMAT(8X,12F6.0)                                                 1200
      IF(IPNT.GT.0) WRITE (6,1260) M,(QII(I,M),I=1,NPER)                1201
C                                  BRANCH TO  1260 FROM  1350.03        1202
 1260 FORMAT(4H STA,I4,8X,14F8.0)                                       1203
C                                  BRANCH TO  1270 FROM  1230.01        1204
 1270 CONTINUE                                                          1205
      IF(IEVYR) 1300,1340,1280                                          1206
C                                          **CARD YE**                 1207
C                                  BRANCH TO  1280 FROM  1270.01        1208
 1280 READ(2,1250) (EVAPO(I),I=1,NPER)                                  1209
      IF(IPNT.GT.0) WRITE(6,1290)(EVAPO(I),I=1,NPER)                    1210
 1290 FORMAT(14H **EVAPORATION/16X,14F8.2)                              1211
      GO TO 1340                                                        1212
C                                  BRANCH TO  1300 FROM  1270.01        1213
 1300 IF(IPNT.GT.0) WRITE(6,1310)                                       1214
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```
 1310 FORMAT(14H **EVAPORATION)                                          1215
      DO 1330 MX=1,NCPT                                                 1216
      M=ICPT(MX)                                                        1217
      IF(IEV(M).LE.0) GO TO 1330                                        1218
C                                                  **CARD EV**          1219
      READ(2,1250)  (EVP(I,M),I=1,NPER)                                 1220
      IF(IPNT.GT.0) WRITE(6,1320)M,(EVP(I,M),I=1,NPER)                  1221
 1320 FORMAT(4H STA,I4,8X,14F8.2)                                       1222
C                               BRANCH TO  1330 FROM  1310.01  1310.03 1223
 1330 CONTINUE                                                          1224
C                               BRANCH TO  1340 FROM  1270.01  1290.01 1225
 1340 IF (NDVYR.LE.0) GO TO 1380                                        1226
      IF(IPNT.GT.0)WRITE(6,1350)                                        1227
 1350 FORMAT(25H **DIVERSION REQUIREMENTS)                              1228
      DO 1370 IX=1,NDVYR                                                1229
C                                                  **CARD YD**          1230
      READ(2,1240) M,(TMPP(I),I=1,NPER)                                 1231
      IF(IPNT.GT.0)WRITE(6,1260) M,(TMPP(I),I=1,NPER)                   1232
      ID=IDIV(M)                                                        1233
      DO 1360 I=1,NPER                                                  1234
      QDIV(I,ID)=TMPP(I)*CSTO(I)                                        1235
      QDIVS(I,ID)=QDIV(I,ID)                                            1236
C                               BRANCH TO  1360 FROM  1350.05          1237
 1360 CONTINUE                                                          1238
C                               BRANCH TO  1370 FROM  1350.01          1239
 1370 CONTINUE                                                          1240
C                               BRANCH TO  1380 FROM  1340.00          1241
 1380 IF(IPWYR.LE.0) GO TO 1460                                         1242
      IF(IPNT.GT.0)WRITE(6,1390)                                        1243
 1390 FORMAT(21H **POWER REQUIREMENTS)                                  1244
      DO 1420 IP=1,NPWR                                                 1245
C                                                  **CARD YP**          1246
      READ(2,1250)(POWR(I,IP),I=1,NPER)                                 1247
      IF(IPNT.GT.0)WRITE(6,1400) IPR(IP),(POWR(I,IP),I=1,NPER)          1248
C                               BRANCH TO  1400 FROM  1470.03          1249
 1400 FORMAT(4H STA,I4,8X,14F8.0)                                       1250
      DO 1410 I=1,NPER                                                  1251
      IF (POWR(I,IP).GT.(-.1)) GO TO 1410                               1252
      ANDYS=NDAYS(I)                                                    1253
      POWR(I,IP)=POWR(I,IP)*PWRMX(IP)*(-.024)*ANDYS                     1254
C                               BRANCH TO  1410 FROM  1400.01  1400.02 1255
 1410 CONTINUE                                                          1256
C                               BRANCH TO  1420 FROM  1390.01          1257
 1420 CONTINUE                                                          1258
      IF (NPWRS.LE.0) GO TO 1460                                        1259
      IF(IPNT.GT.0)WRITE(6,1430)                                        1260
 1430 FORMAT(28H **SYSTEM POWER REQUIREMENTS)                           1261
      DO 1450 IX=1,NPWRS                                                1262
C                                                  **CARD YS**          1263
      READ(2,1250)(PWRS(I,IX),I=1,NPER)                                 1264
      IF(IPNT.GT.0)WRITE(6,1440)IX,(PWRS(I,IX),I=1,NPER)                1265
 1440 FORMAT(4H SYS,I4,8X,14F8.0)                                       1266
C                               BRANCH TO  1450 FROM  1430.01          1267
 1450 CONTINUE                                                          1268
C                               BRANCH TO  1460 FROM  1380.00  1420.01 1269
 1460 IF(NQYR.LE.0)GO TO 1500                                           1270
      IF(IPNT.GT.0)WRITE(6,1470)                                        1271
 1470 FORMAT(23H **MINIMUM DESIRED FLOW)                                1272
      DO 1490 IX=1,NQYR                                                 1273
C                                                  **CARD YQ**          1274
      READ(2,1240)M,(QMIN(I,M),I=1,NPER)                                1275
      IF(IPNT.GT.0) WRITE(6,1400) M,(QMIN(I,M),I=1,NPER)                1276
      DO 1480 I=1,NPER                                                  1277
      QMIN(I,M)=QMIN(I,M)*CSTO(I)                                       1278
      IF(IFLOW.EQ.M)TMPR(I)=QMIN(I,M)                                   1279
C                               BRANCH TO  1480 FROM  1470.04          1280
 1480 CONTINUE                                                          1281
C                               BRANCH TO  1490 FROM  1470.01          1282
 1490 CONTINUE                                                          1283
C                               BRANCH TO  1500 FROM  1460.00          1284
 1500 IF(IFLOW.LE.0) GO TO 1520                                         1285
      DO 1510 I=1,NPER                                                  1286
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```
 1510 QMIN(I,IFLOW)=TMPR(I)*CFLOW                                        1287
C                                BRANCH TO  1520 FROM  1500.00          1288
 1520 IF(NLYR.LE.0)GO TO 1620                                            1289
      IF(IPNT.GT.0) WRITE(6,1530)                                        1290
 1530 FORMAT(16H **STORAGE LEVEL)                                        1291
      DO 1610 IX=1,NLYR                                                  1292
C                                                 **CARD YL**           1293
      READ(2,1540) L,M,IRPT,FACTR,(STORL(I,M,L),I=1,6)                   1294
 1540 FORMAT(2X,I2,2I3,7F8.0)                                            1295
      IF(FACTR.LE.0.)FACTR=1.                                            1296
      IF(IRPT.GE.0)GO TO 1560                                            1297
      TEMP=STORL(1,M,L)                                                  1298
      DO 1550 I=2,NPER                                                   1299
      STORL(I,M,L)=TEMP                                                  1300
C                                BRANCH TO  1550 FROM  1540.04          1301
 1550 CONTINUE                                                           1302
      GO TO 1580                                                         1303
C                                BRANCH TO  1560 FROM  1540.02          1304
 1560 IF(NPER.LE.6) GO TO 1580                                           1305
      READ(2,1570)(STORL(I,M,L),I=7,NPER)                                1306
 1570 FORMAT(32X,6F8.0)                                                  1307
C                                BRANCH TO  1580 FROM  1550.01  1560.00 1308
 1580 DO 1590 I=1,NPER                                                   1309
      STORL(I,M,L)=STORL(I,M,L)*FACTR                                    1310
C                                BRANCH TO  1590 FROM  1580.00          1311
 1590 CONTINUE                                                           1312
      IF(IPNT.GT.0) WRITE(6,1600) L,M,(STORL(I,M,L),I=1,NPER)            1313
 1600 FORMAT(4H LVL,I4,4H STA,I4,14F8.0)                                 1314
C                                BRANCH TO  1610 FROM  1530.01          1315
 1610 CONTINUE                                                           1316
C =D=              CONVERT INPUT FLOWS TO LOCAL INFLOWS                  1317
C                                BRANCH TO  1620 FROM  1520.00          1318
 1620 KX=1                                                               1319
      DO 1710 MX = 1, NCPT                                               1320
      M = ICPT(MX)                                                       1321
      IF (NFLW(M).LE.0) GO TO 1690                                       1322
      ITMP = NFLW(M)+KX-1                                                1323
      DO 1630 I= 1, NPER                                                 1324
 1630 QL(I,M) = 0.                                                       1325
      DO 1660 K=KX,ITMP                                                  1326
      ITEMP = MQ(K)                                                      1327
      DO 1650 I=1,NPER                                                   1328
      QL(I,M)=QL(I,M)+QII(I,ITEMP)*RTIO(K)*CSTI(I)                       1329
      IF(JUPQI.LE.0) GO TO 1650                                          1330
      ITP=NUPQI(M)                                                       1331
      IF(ITP.LE.0) GO TO 1650                                            1332
      DO 1640 KJ=1,ITP                                                   1333
      NX=IUPQI(M,KJ)                                                     1334
      QL(I,M)=QL(I,M)+QL(I,NX)                                           1335
C                                BRANCH TO  1640 FROM  1630.08          1336
 1640 CONTINUE                                                           1337
C                                BRANCH TO  1650 FROM  1630.03  1630.05 1338
C                                    1630.07                            1339
 1650 CONTINUE                                                           1340
C                                BRANCH TO  1660 FROM  1630.01          1341
 1660 CONTINUE                                                           1342
      DO 1680 I=1,NPER                                                   1343
      IF(QL(I,M).GE.0.) GO TO 1680                                       1344
      TEMP=(-QL(I,M))*CSOUT(I)                                           1345
      WRITE(6,1670)TEMP,QUNIT,M,I                                        1346
 1670 FORMAT(F8.0,1X,A4,9H ADDED TO  ,I3,11H DURING PER ,I3)             1347
      QL(I,M)=0.                                                         1348
C                                BRANCH TO  1680 FROM  1660.01  1660.02 1349
 1680 CONTINUE                                                           1350
      KX = ITMP + 1                                                      1351
      GO TO 1710                                                         1352
C                                BRANCH TO  1690 FROM  1620.03          1353
 1690 DO 1700 I=1,NPER                                                   1354
 1700 QL(I,M) = QII(I,M)*CSTI(I)                                         1355
C                                BRANCH TO  1710 FROM  1620.01  1680.02 1356
 1710 CONTINUE                                                           1357
C                                                                        1358
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      DO 1730 MX=1,NCPT                                                 1359
      M=ICPT(MX)                                                        1360
      DO 1720 I=1,NPER                                                  1361
      IF(QMIN2(I,M),LT,QLKG(M))QMIN2(I,M)=QLKG(M)                       1362
      IF(QMIN(I,M),LT,QMIN2(I,M))QMIN(I,M)=QMIN2(I,M)                   1363
      QMINA(I,M) = QMIN(I,M)                                            1364
      QMINS(I,M)=QMINA(I,M)                                             1365
C                                BRANCH TO  1720 FROM  1710,03          1366
 1720 CONTINUE                                                          1367
C =E=   INITIATE ANNUAL TOTALS                                          1368
      SYQL(M)=0.                                                        1369
      SYPRE(M)=0.                                                       1370
      SYQI(M)=0.                                                        1371
      SYQMN(M) = .001                                                   1372
      SYCNS(M)=0.                                                       1373
      SYQA(M)=0.                                                        1374
      SYSHQ(M)=0.                                                       1375
      SYSH2(M)=0.                                                       1376
      SYQ(M) = .001                                                     1377
      IF (IRES(M),GT,0) SYEVP(M)=0.                                     1378
C                                BRANCH TO  1730 FROM  1710,01  1710,02 1379
 1730 CONTINUE                                                          1380
      IF (NDIV,LE,0) GO TO 1750                                         1381
      DO 1740 ID= 1, NDIV                                               1382
      SYDV(ID) = .001                                                   1383
      SYDVA(ID)=0.                                                      1384
C                                BRANCH TO  1740 FROM  1730,02          1385
 1740 SYSHD(ID)=0.                                                      1386
C                                BRANCH TO  1750 FROM  1730,01          1387
 1750 ITMP=KPWR+KPWRS                                                   1388
      DO 1760 IP= 1, ITMP                                               1389
      SYPWR(IP)=0.                                                      1390
      SYSP(IP)=0.                                                       1391
      SYPR(IP) = .001                                                   1392
      SYPMX(IP)=99999999.                                               1393
      SYSYS(IP)=0.                                                      1394
C                                BRANCH TO  1760 FROM  1750,01          1395
 1760 SYSHP(IP) = 0.                                                    1396
      ID=4                                                              1397
      IP=6                                                              1398
      IF(IPWKW,LE,0) GO TO 1770                                         1399
      ID=1                                                              1400
      IP=3                                                              1401
C                                BRANCH TO  1770 FROM  1760,03          1402
 1770 IF(IPNT,GT,0)WRITE(6,1780)QUNIT,VUNIT,(PUNIT(I),I=ID,IP)          1403
 1780 FORMAT (/// 25X,14H ALL FLOWS IN A4,23H, STORAGES AND EVAP IN A4, 1404
     .  15H, AND POWER IN 3A4)                                          1405
C     ***************                                                   1406
      CALL COMP (J)                                                     1407
C     ***************                                                   1408
C =F=      COMPUTE CUMULATIVE AVERAGES AND SHORTAGE INDEXES,PRINT       1409
      IF(IFLOW,LE,0)GO TO 1830                                          1410
      DO 1820 I=1,NPER                                                  1411
      ANDYS=NDAYS(I)                                                    1412
      CQS=CONST*ANDYS                                                   1413
      TEMP=0.                                                           1414
      TMP=0.                                                            1415
      TP=0.                                                             1416
      NRESM=NRESR(IFLOW)                                                1417
      DO 1790 K=1,NRESM                                                 1418
      IR=IRESM(IFLOW,K)                                                 1419
      IF(IR,LT,1) GO TO 1790                                            1420
      TEMP=TPMP+STORB(I,IR)                                             1421
      ITP=NL=NLF+1                                                      1422
      TMP=TMP+STORL(I,IR,ITP)                                           1423
      TP = TP+STORL(I,IR,2)                                             1424
C                                BRANCH TO  1790 FROM  1780,11  1780,13 1425
 1790 CONTINUE                                                          1426
      IF(TEMP+1.,LT,TMP) GO TO 1800                                     1427
      TFLOW=0.                                                          1428
      SHRTA=0.                                                          1429
      GO TO 1820                                                        1430
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C                                   BRANCH TO  1800 FROM  1790.01          1431
 1800 IF(TFLOW.LT.(-.5))GO TO 1820                                          1432
      TFLOW=TFLOW+QMINA(I,IFLOW)                                            1433
      IF(TFLOW.LE.0.)GO TO 1820                                             1434
      TMP=QMINA(I,IFLOW)-QA(I,IFLOW)-.1                                     1435
      IF(TMP.LE.0.)GO TO 1810                                               1436
      SHRTA=SHRTA+TMP                                                       1437
      TMP=SHRTA/TFLOW                                                       1438
      IF(TMP.GT.SHORT)SHORT=TMP                                             1439
      GO TO 1820                                                            1440
C                                   BRANCH TO  1810 FROM  1800.04          1441
 1810 TMP=(TEMP-TP)/(TFLOW*COS)                                             1442
      IF(TMP.LT.SRPLS)SRPLS=TMP                                             1443
C                                   BRANCH TO  1820 FROM  1780.04  1790.04 1444
C                                       1800.00  1800.02  1800.08          1445
 1820 CONTINUE                                                              1446
      IF(IPNT.LE.0)GO TO 2640                                               1447
C                                   BRANCH TO  1830 FROM  1780.03          1448
 1830 ANYRS = J                                                             1449
      RNYRS = 1./ANYRS                                                      1450
      ANYR = ANYRS-1.                                                       1451
      DO 2550 MX=1,NCPT                                                     1452
      M=ICPT(MX)                                                            1453
      JPRNT=IPRN(M)+IPRNT                                                   1454
      ITMP=NRESR(M)                                                         1455
      IF(IECON.LE.0) GO TO 2030                                             1456
C               ALLOCATE BENEFITS                                           1457
      IF(ITMP.LE.0) GO TO 1970                                              1458
      DO 1950 I=1,NPER                                                      1459
      SUM=0.                                                                1460
      DO 1910 K=1,ITMP                                                      1461
      IR=IRESM(M,K)                                                         1462
      IF(IR.LT.0)IR=-IR                                                     1463
      TMPP(K)=QA(I,IR)-QI(I,IR)                                             1464
C                                   BRANCH TO  1910 FROM  1900.17          1465
 1910 SUM=SUM+TMPP(K)                                                       1466
      TMPX(I)=SUM                                                           1467
      TMP=ITMP                                                              1468
      TMP=1./TMP                                                            1469
C                                   BRANCH TO  1920 FROM  1920.06          1470
 1920 DO 1940 K=1,ITMP                                                      1471
      QII(I,K)=TMP                                                          1472
      IF(SUM.LE.0.) GO TO 1940                                              1473
      IF(SUM*TMPP(K).GT.(-.0001)) GO TO 1930                                1474
      SUM=SUM-TMPP(K)                                                       1475
      TMPP(K)=0.                                                            1476
      GO TO 1920                                                            1477
C                                   BRANCH TO  1930 FROM  1920.03          1478
 1930 QII(I,K)=TMPP(K)/SUM                                                  1479
C                                   BRANCH TO  1940 FROM  1920.00  1920.02 1480
 1940 CONTINUE                                                              1481
C                                   BRANCH TO  1950 FROM  1900.15          1482
 1950 CONTINUE                                                              1483
      DO 1960 K=1,ITMP                                                      1484
 1960 WRITE (3)  (QII(I,K),I=1,NPER)                                        1485
      WRITE (3) (TMPX(I),I=1,NPER)                                          1486
C                                   BRANCH TO  1970 FROM  1900.14          1487
 1970 DO 2020 K=1,8                                                         1488
      ITP=IE(K,M)                                                           1489
      IF(ITP.LE.0)ITP=5                                                     1490
      GO TO (1980,1990,2000,2010,2020),ITP                                  1491
 1980 WRITE (3)  (QA(I,M),I=1,NPER)                                         1492
      WRITE (3)  (QPREP(I,M),I=1,NPER)                                      1493
      GO TO 2020                                                            1494
C                                   BRANCH TO  1990 FROM  1970.03          1495
 1990 WRITE (3)  (STORB(I,M),I=1,NPER)                                      1496
      GO TO 2020                                                            1497
C                                   BRANCH TO  2000 FROM  1970.03          1498
 2000 IP=IPWR(M)                                                            1499
      WRITE (3)  (POWER(I,IP),I=1,NPER)                                     1500
      GO TO 2020                                                            1501
C                                   BRANCH TO  2010 FROM  1970.03          1502
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```
 2010 ID=IDIV(M)                                                          1503
      IF(ID.LT.0)ID=-ID                                                   1504
      WRITE (3) (QDIVA(I,ID),I=1,NPER)                                    1505
C                                BRANCH TO  2020 FROM  1970.00  1970.03 1506
C                                    1980.02  1990.01  2000.02          1507
 2020 CONTINUE                                                            1508
C =G=          CONVERT OUTPUT UNITS                                      1509
 2030 IF(IUNIT.LE.0) GO TO 1900                                           1510
      SYQL(M)=SYQL(M)*CCFS                                                1511
      SYPRE(M)=SYPRE(M)*CCFS                                              1512
      SYQI(M)=SYQI(M)*CCFS                                                1513
      SYQA(M)=SYQA(M)*CCFS                                                1514
      SYCNS(M)=SYCNS(M)*CCFS                                              1514.1
      SYQ(M)=SYQ(M)*CCFS                                                  1515
      SYSHQ(M)=SYSHQ(M)*CCFS                                              1516
      SYQMN(M)=SYQMN(M)*CCFS                                              1517
      SYSH2(M)=SYSH2(M)*CCFS                                              1518
      ID=IDIV(M)                                                          1519
      IF(ID.LT.0) ID=(-ID)                                                1520
      IF(ID.LE.0) GO TO 1850                                              1521
      SYDV(ID)=SYDV(ID)*CCFS                                              1522
      SYDVA(ID)=SYDVA(ID)*CCFS                                            1523
      SYSHD(ID)=SYSHD(ID)*CCFS                                            1524
      DO 1840 I=1,NPER                                                    1525
      QDIVA(I,ID)=QDIVA(I,ID)*CSOUT(I)                                    1526
C                                                                         1527
 1840 SHDIV(I,ID)=SHDIV(I,ID)*CSOUT(I)                                    1528
C                                BRANCH TO  1850 FROM  1830.16          1529
 1850 IF(IRES(M).LE.0) GO TO 1880                                         1530
      STOR1(M)=STOR1(M)*CACFT                                             1531
      SYEVP(M)=SYEVP(M)*CACFT                                             1532
      DO 1870 I=1,NPER                                                    1533
      STORB(I,M)=STORB(I,M)*CACFT                                         1534
      EVP(I,M)=EVP(I,M)*CACFT                                             1535
C                                BRANCH TO  1870 FROM  1850.02  1850.05 1536
 1870 CONTINUE                                                            1537
C                                BRANCH TO  1880 FROM  1850.00          1538
 1880 DO 1890 I=1,NPER                                                    1539
      QCONS(I,M)=QCONS(I,M)*CSOUT(I)                                      1540
      QL(I,M)=QL(I,M)*CSOUT(I)                                            1541
      QPREP(I,M)=QPREP(I,M)*CSOUT(I)                                      1542
      QI(I,M)=QI(I,M)*CSOUT(I)                                            1543
      QA(I,M)=QA(I,M)*CSOUT(I)                                            1544
      SHRTQ(I,M)=SHRTQ(I,M)*CSOUT(I)                                      1545
      IF(QM2(M).LE.0..AND.QM2(M).GT.(-.5))GO TO 1890                      1546
      SHRT2(I,M)=SHRT2(I,M)*CSOUT(I)                                      1547
C                                BRANCH TO  1890 FROM  1880.00  1880.09 1548
 1890 CONTINUE                                                            1549
C =H=          LONG-TERM AVERAGES                                        1550
C                                BRANCH TO  1900 FROM  1830.05          1551
 1900 SQL(M) = (SQL(M)*ANYR+SYQL(M))*RNYRS                                1552
      SPRE(M) = (SPRE(M)*ANYR+SYPRE(M))*RNYRS                             1553
      SQI(M) =(SQI(M)*ANYR+SYQI(M))*RNYRS                                 1554
      SQMN(M) = (SQMN(M)*ANYR+SYQMN(M))*RNYRS                             1555
      SCNS(M) = (SCNS(M)*ANYR +SYCNS(M))*RNYRS                            1556
      SQA(M) = (SQA(M)*ANYR +SYQA(M))*RNYRS                               1557
      SQ(M) = (SQ(M)*ANYR+SYQ(M))*RNYRS                                   1558
      SSHQ(M) =(SSHQ(M)*ANYR+SYSHQ(M))*RNYRS                              1559
      SSH2(M)=(SSH2(M)*ANYR+SYSH2(M))*RNYRS                               1560
      QINDX(M)=QINDX(M)+(SYSHQ(M)/SYQ(M))**2                              1561
      Q2NDX(M)=Q2NDX(M)+(SYSH2(M)/SYQMN(M))**2                            1562
C =I=          PRINT INFLOWS AND DIVERSION                               1563
C                                BRANCH TO  2030 FROM  1900.13          1564
      IF(JPRNT.LE.(-1))GO TO 2150                                         1565
      WRITE(6,2040)                                                       1566
 2040 FORMAT(/1X,111(1H+))                                                1567
      WRITE (6,1010)                                                      1568
      IF (NRESR(M).LE.0) GO TO 2060                                       1569
      WRITE(6,2050)M,(CPT(M,K),K=1,8),QLKG(M),(IRESM(M,K),K=1,ITMP)       1570
C                                BRANCH TO  2050 FROM  2060.00          1571
 2050 FORMAT(I4,1X,8A4,9H LEAKAGE F8.0,10H SERVED BY 18I4/(34X,21I4))     1572
      GO TO 2070                                                          1573
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C                                   BRANCH TO  2060 FROM  2040.02          1574
 2060 WRITE (6,2050) M,(CPT(M,K),K=1,8)                                    1575
C                                   BRANCH TO  2070 FROM  2050.01          1576
 2070 IF (IRES(M).LE.0) GO TO 2090                                         1577
      ITMP=NSERV(M)                                                        1578
      WRITE(6,2080)(ISERV(M,K),K=1,ITMP)                                   1579
 2080 FORMAT(33X,7HSERVING2X,19I4)                                         1580
C                                   BRANCH TO  2090 FROM  2070.00          1581
 2090 IF (NDIVR(M).LE.0) GO TO 2110                                        1582
      ITMP=NDIVR(M)                                                        1583
      WRITE(6,2100) (IDIVR(M,K),K=1,ITMP)                                  1584
 2100 FORMAT (33X,16HLOCAL DIVERSIONS 17I4)                                1585
C                                   BRANCH TO  2110 FROM  2090.00          1586
 2110 WRITE(6,2120)IYR,(APERD(I),APRD(I),I=1,NPER)                         1587
 2120 FORMAT(/3H YR I5,4X,4HAVG  (28A4))                                   1588
      WRITE(6,2130)          SYQL(M),(QL(I,M),I=1,NPER)                    1589
C                                   BRANCH TO  2130 FROM  2710.07          1590
 2130 FORMAT (8H LOC FLW  F8.0,(14F8.0))                                   1591
      WRITE(6,2140)          SYPRE(M),(QPREP(I,M),I=1,NPER)                1592
C                                   BRANCH TO  2140 FROM  2710.08          1593
 2140 FORMAT (8H UNREG   F8.0,(14F8.0))                                    1594
C                                   BRANCH TO  2150 FROM  2030.00          1595
 2150 ID=IDIV(M)                                                           1596
      IF(ID.EQ.0.AND.IRES(M).LE.0) GO TO 2170                              1597
      IF(JPRNT.LE.(-1)) GO TO 2170                                         1598
      WRITE(6,2160)SYQI(M),(QI(I,M),I=1,NPER)                              1599
C                                   BRANCH TO  2160 FROM  2710.10          1600
 2160 FORMAT (8H INFLOW   F8.0,(14F8.0))                                   1601
C                                   BRANCH TO  2170 FROM  2150.01  2150.02 1602
 2170 IF(ID)2180,2230,2190                                                 1603
 2180 ID=(-ID)                                                             1604
C                                   BRANCH TO  2190 FROM  2170.00          1605
 2190 SDV(ID) = (SDV(ID)*ANYR+SYDV(ID))*RNYRS                              1606
      SDVA(ID) = (SDVA(ID)*ANYR+SYDVA(ID))*RNYRS                           1607
      SSHD(ID) = (SSHD(ID)*ANYR+SYSHD(ID))*RNYRS                           1608
      DINDX(ID)=DINDX(ID)+(SYSHD(ID)/SYDV(ID))**2                          1609
      IF(JPRNT.LE.(-1)) GO TO 2230                                         1610
      DO 2196 I=1,NPER                                                     1611
      TMPX(I)=QDIV(I,ID)                                                   1612
      IF(IUNIT.LE.0)GO TO 2196                                             1613
      TMPX(I)=TMPX(I)*CSOUT(I)                                             1614
 2196 CONTINUE                                                             1615
      WRITE (6,2200) SYDV(ID),(TMPX(I),I=1,NPER)                           1616
C                                   BRANCH TO  2200 FROM  2730.00          1617
 2200 FORMAT (8H REQ DIV  F8.1,(14F8.1))                                   1618
      WRITE(6,2210)SYDVA(ID),(QDIVA(I,ID),I=1,NPER)                        1619
C                                   BRANCH TO  2210 FROM  2730.01          1620
 2210 FORMAT (8H DIVERSN  F8.1,(14F8.1))                                   1621
      WRITE(6,2220)SYSHD(ID),(SHDIV(I,ID),I=1,NPER)                        1622
C                                   BRANCH TO  2220 FROM  2730.02          1623
 2220 FORMAT (8H SHORTGE  F8.1,(14F8.1))                                   1624
C                                   BRANCH TO  2230 FROM  2170.00  2190.04 1625
 2230 IF (IRES(M).LE.0) GO TO 2490                                         1626
C =J=          PRINT RESERVOIR DATA                                       1627
      SEVP(M) = (SEVP(M)*ANYR+SYEVP(M))*RNYRS                              1628
      IF(JPRNT.LE.(-1)) GO TO 2320                                         1629
      IF(IPRL.LE.0) GO TO 2270                                             1630
      DO 2250 L = 1, NL                                                    1631
      K = NL - L + 1                                                       1632
      DO 2240 I=1,NPER                                                     1633
 2240 ISTOR(I)=STORL(I,M,K)*CACFT                                          1634
C                                   BRANCH TO  2250 FROM  2230.04          1635
 2250 WRITE(6,2260)K,(ISTOR(I),I=1,NPER)                                   1636
 2260 FORMAT (6H LEVEL I4,6X,(14I8))                                       1637
C                                   BRANCH TO  2270 FROM  2230.03          1638
 2270 DO 2280 I=1,NPER                                                     1639
 2280 ISTOR(I) = STORB(I,M)+.5                                             1640
      WRITE(6,2290)(ISTOR(I),I=1,NPER)                                     1641
 2290 FORMAT (/8H EOP STR 8X,(14I8))                                       1642
      WRITE(6,2300)(ELEV(I,M), I=1,NPER)                                   1643
 2300 FORMAT (7H EOP EL  9X,(14F8.2))                                      1644
      WRITE(6,2310)SYEVP(M),(EVP(I,M),I=1,NPER)                            1645
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C                                   BRANCH TO  2310 FROM  2740.01          1646
 2310 FORMAT (8H EVAPO   F8.0,(14F8.0))                                    1647
C                                   BRANCH TO  2320 FROM  2230.02          1648
 2320 IF (IPWR(M).LE.0) GO TO 2460                                         1649
      IP = IPWR(M)                                                         1650
      SPR(IP) = (SPR(IP)*ANYR+SYPR(IP))*RNYRS                              1651
      SPWR(IP) = (SPWR(IP)*ANYR+SYPWR(IP))*RNYRS                           1652
      SSHP(IP) = (SSHP(IP)*ANYR+SYSHP(IP))*RNYRS                           1653
      SSP(IP)=(SSP(IP)*ANYR+SYSP(IP))*RNYRS                                1654
      PINDX(IP)=PINDX(IP)+(SYSHP(IP)/SYPR(IP))**2                          1655
      IF(IPWKW.LE.0) GO TO 2380                                            1656
      TEMP=SPR(IP)/(.024*SYDYS)                                            1657
      SYPR(IP)=SYPR(IP)/(.024*SYDYS)                                       1658
      DO 2330 I=1,NPER                                                     1659
      TMP=NDAYS(I)                                                         1660
      TMP=TMP*.024                                                         1661
      TMPX(I)=POWR(I,IP)/TMP                                               1662
      PWER(I,IP)=PWER(I,IP)/TMP                                            1663
      POWER(I,IP)=POWER(I,IP)/TMP                                          1664
      SHRTP(I,IP)=SHRTP(I,IP)/TMP                                          1665
C                                   BRANCH TO  2330 FROM  2320.10          1666
 2330 CONTINUE                                                             1667
      TEMP=SYSHP(IP)/(.024*SYDYS)                                          1668
      TMP=SYPWR(IP)/(.024*SYDYS)                                           1669
      TSYP=SYSP(IP)/(.024*SYDYS)                                           1670
      IF(JPRNT.LE.(-1)) GO TO 2430                                         1671
      WRITE(6,2340)SYPR(IP),(TMPX(I),I=1,NPER)                             1672
C                                   BRANCH TO  2340 FROM  2740.06          1673
 2340 FORMAT (7H REQ KW 1X,F8.0,(14F8.0))                                  1674
      WRITE(6,2350) TSYP,(PWER(I,IP),I=1,NPER)                             1675
C                                   BRANCH TO  2350 FROM  2390.01  2750.01 1676
 2350 FORMAT(4H SYS I4,F8.0,(14F8.0))                                      1677
      WRITE(6,2360)TMP,(POWER(I,IP),I=1,NPER)                              1678
C                                   BRANCH TO  2360 FROM  2740.08          1679
 2360 FORMAT(7H GEN KW 1XF8.0,(14F8.0))                                    1680
      WRITE(6,2370)TEMP,(SHRTP(I,IP),I=1,NPER)                             1681
C                                   BRANCH TO  2370 FROM  2400.01  2620.01 1682
C                                     2740.10  2750.03                     1683
 2370 FORMAT (8H SHORTGE F8.0,(14F8.0))                                    1684
      GO TO 2430                                                           1685
C                                   BRANCH TO  2380 FROM  2320.07          1686
 2380 IF(JPRNT.LE.(-1)) GO TO 2420                                         1687
      WRITE(6,2390)SYPR(IP),(POWR(I,IP),I=1,NPER)                          1688
C                                   BRANCH TO  2390 FROM  2750.00          1689
 2390 FORMAT (8H REQ PWR  F8.0,(14F8.0))                                   1690
      IF(ISYSR(M).GT.0)WRITE(6,2350)ISYSR(M),SYSP(IP),                     1691
     .  (PWER(I,IP),I=1,NPER)                                              1692
      WRITE(6,2400)SYPWR(IP),(POWER(I,IP),I=1,NPER)                        1693
C                                   BRANCH TO  2400 FROM  2750.02          1694
 2400 FORMAT (8H POWER   F8.0,(14F8.0))                                    1695
      WRITE(6,2370)SYSHP(IP),(SHRTP(I,IP),I=1,NPER)                        1696
      IF(ISYSR(M).GT.0)WRITE(6,2410)SYSYS(IP),(SYSSP(I,IP),I=1,NPER)       1697
 2410 FORMAT(8H SYS SRT F8.0,(14F8.0))                                     1698
C                                   BRANCH TO  2420 FROM  2380.00          1699
 2420 TMP=SYPWR(IP)                                                        1700
      TEMP=SYSHP(IP)                                                       1701
C                                   BRANCH TO  2430 FROM  2330.04  2370.01 1702
 2430 IF(IPOW(IP).LE.0) GO TO 2460                                         1703
      DO 2440 I=1,NPER                                                     1704
      TMP=POWRP(I,IP)                                                      1705
      IF (TMP.LT.SYPMX(IP)) SYPMX(IP)=TMP                                  1706
      IF (TMP.LT.SPMX(IP)) SPMX(IP)=TMP                                    1707
C                                   BRANCH TO  2440 FROM  2430.01          1708
 2440 CONTINUE                                                             1709
      IF(JPRNT.GT.(-1))WRITE(6,2450)                                       1710
     .                  SYPMX(IP),(POWRP(I,IP),I=1,NPER)                   1711
C                                   BRANCH TO  2450 FROM  2440.01  2760.01 1712
 2450 FORMAT (8H PEAK KW F8.0,(14F8.0))                                    1713
C                                   BRANCH TO  2460 FROM  2320.00  2430.00 1714
 2460 IF(JPRNT.LE.(-1)) GO TO 2550                                         1715
      WRITE(6,2470)(ICSE(I,M),I=1,NPER)                                    1716
 2470 FORMAT (5H CASE 11X,(14I8))                                          1717
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      WRITE(6,2480)(CNTRL(I,M),I=1,NPER)                                1718
 2480 FORMAT (6H LEVEL 10X,(14F8.2))                                    1719
C                                  BRANCH TO  2490 FROM  2230.00       1720
 2490 IF(JPRNT.LE.(-1)) GO TO 2550                                      1721
C *K*          PRINT OUTFLOWS                                          1722
      IF (IRES(M).GT.0)WRITE(6,2500)                                    1723
     .                  SYCNS(M),(QCONS(I,M),I=1,NPER)                 1724
C                                  BRANCH TO  2500 FROM  2490.01  2770.00 1725
 2500 FORMAT(/8H CSV REL F8.0,(14F8.0))                                 1726
      WRITE(6,2510)SYQA(M),(QA(I,M),I=1,NPER)                           1727
C                                  BRANCH TO  2510 FROM  2770.01       1728
 2510 FORMAT (8H RIV FLW F8.0,(14F8.0))                                 1729
      DO 2515 I=1,NPER                                                  1730
      TMPX(I)=QMINA(I,M)                                                1731
      IF(IUNIT.GT.0) TMPX(I)=TMPX(I)*CSOUT(I)                           1732
 2515 CONTINUE                                                          1733
      WRITE(6,2520)SYQ(M),(TMPX(I),I=1,NPER)                            1734
C                                  BRANCH TO  2520 FROM  2770.02       1735
 2520 FORMAT (8H DES FLW F8.0,(14F8.0))                                 1736
      WRITE(6,2530) SYSHQ(M),(SHRTQ(I,M),I=1,NPER)                      1737
C                                  BRANCH TO  2530 FROM  2540.01  2770.03 1738
C                                     2770.06                          1739
 2530 FORMAT (8H SHORTGE F8.0,(14F8.0))                                 1740
      IF (QM2(M).LE.0..AND.QM2(M).GT.(-.1)) GO TO 2550                  1741
      DO 2535 I=1,NPER                                                  1742
      TMPX(I)=QMIN2(I,M)                                                1743
      IF(IUNIT.GT.0) TMPX(I)=TMPX(I)*CSOUT(I)                           1744
 2535 CONTINUE                                                          1745
      WRITE(6,2540)SYQMN(M),(TMPX(I),I=1,NPER)                          1746
C                                  BRANCH TO  2540 FROM  2770.05       1747
 2540 FORMAT (8H MIN FLW F8.0,(14F8.0))                                 1748
      WRITE(6,2530)SYSH2(M),(SHRT2(I,M),I=1,NPER)                       1749
C              END OF DO LOOP STARTING AT 1830+3                       1750
C                                  BRANCH TO  2550 FROM  1830.03  2460.00 1751
C                                      2490.00  2530.01                1752
 2550 CONTINUE                                                          1753
      IF(ISWRY.LE.0)GO TO 2560                                          1754
      IF(IRG(1).GT.0)WRITE(4)SYPRE,QPREP                                1755
      IF(IRG(2).GT.0)WRITE(4)SYQA,QA                                    1756
      IF(IRG(3).GT.0)WRITE(4)SYDVA,QDIVA                                1757
      IF(IRG(4).GT.0)WRITE(4)SYSHD,SHDIV                                1758
      IF(IRG(5).GT.0)WRITE(4)SYSHQ,SHRTQ                                1759
      IF(IRG(6).GT.0)WRITE(4)SYSH2,SHRT2                                1760
      IF(IRG(7).GT.0.OR.IRG(8).GT.0)WRITE(4)STOR1,STORB                 1761
      IF(IRG(9).GT.0)WRITE(4)ELEV                                       1762
      IF(IRG(10).GT.0)WRITE(1)SYQI,QI,STORB,ELEV,SYEVP,EVP,SYPWR,POWER, 1763
     . SYSHP,SHRTP,SYPMX,POWRP,SYQA,QA                                  1764
C                                  BRANCH TO  2560 FROM  2550.01       1765
 2560 IYR=IYR+1                                                         1766
      IF (NPWRS.LE.0) GO TO 2640                                        1767
C              SYSTEM POWER SUMMARY                                    1768
      DO 2630 IX=1,NPWRS                                                1769
      WRITE(6,2570)IX                                                   1770
 2570 FORMAT(//49X,6HSYSTEM I2,14H POWER SUMMARY)                       1771
C                                  BRANCH TO  2580 FROM  2710.05       1772
 2580 FORMAT(I3,1X,8A4)                                                 1773
      WRITE(6,2590)                                                     1774
 2590 FORMAT(13H SYSTEM TOTAL)                                          1775
      MX=KPWR+IX                                                        1776
      SPR(MX)=(SPR(MX)*ANYR+SYPR(MX))*RNYRS                             1777
      SPWR(MX)=(SPWR(MX)*ANYR+SYPWR(MX))*RNYRS                          1778
      SSHP(MX)=(SSHP(MX)*ANYR+SYSHP(MX))*RNYRS                          1779
      PINDX(MX)=PINDX(MX)+(SYSHP(MX)/SYPR(MX))**2                       1780
      WRITE(6,2600)SYPR(MX),(PWRS(I,IX),I=1,NPER)                       1781
 2600 FORMAT(8H REQUIRD 15F8.0)                                         1782
      WRITE(6,2610)SYSP(MX),(PWER(I,MX),I=1,NPER)                       1783
 2610 FORMAT(8H USABLE 15F8.0)                                          1784
      WRITE(6,2620)SYPWR(MX),(POWER(I,MX),I=1,NPER)                     1785
 2620 FORMAT(8H TOTAL  15F8.0)                                          1786
      WRITE(6,2370)SYSHP(MX),(SHRTP(I,MX),I=1,NPER)                     1787
C                                  BRANCH TO  2630 FROM  2560.02       1788
 2630 CONTINUE                                                          1789
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C              END OF DO LOOP STARTING AT 1220+1                                1790
C                                  BRANCH TO  2640 FROM  1220,01  1820,01 1791
C                                      2560,01                              1792
 2640 CONTINUE                                                              1793
      IF(IFLOW,LE,0,OR,IPNT,GT,0)GO TO 2700                                 1794
C =L=          SUCCESSIVE APPROXIMATIONS OF YIELD                           1795
      IF(TFLOW,LT,(=,5))SHORT=,3                                            1796
      IF(SHORT,LE,0,)GO TO 2650                                             1797
      IF(SHORT,LE,,01)GO TO 2670                                            1798
      IF(SHORT,GT,,3) SHORT=,3                                              1799
      TPP=CFLOW                                                             1800
      CFLOW=CFLOW*(1,=SHORT)                                                1801
      IF(TPP,GT,1,) GO TO 2660                                              1802
      GO TO 2680                                                            1803
C                                  BRANCH TO  2650 FROM  2640,03            1804
 2650 IF(SRPLS,LE,,01) GO TO 2670                                           1805
      IF(SRPLS,GT,,15) SRPLS=,15                                            1806
      TPP=CFLOW                                                             1807
      CFLOW=CFLOW*(1,+SRPLS)                                                1808
      IF(TPP,GT,1,) GO TO 2680                                              1809
C                                  BRANCH TO  2660 FROM  2640,08            1810
 2660 CFLOW=(CFLOW+TPP)*,5                                                  1811
C                                  BRANCH TO  2670 FROM  2640,04  2650,00 1812
 2670 IPNT=1                                                                1813
C                                  BRANCH TO  2680 FROM  2640,09  2650,04 1814
 2680 ITRNS=1                                                               1815
      IYR=IYR1                                                              1816
      WRITE(6,2690)IFLOW,CFLOW                                              1817
 2690 FORMAT(21HOFLOW REQUIREMENTS AT I3,14H MULTIPLIED BY F6,3)            1818
      GO TO 1070                                                            1819
C              PRINT LONG-TERM AVERAGES                                     1820
C                                  BRANCH TO  2700 FROM  2640,01            1821
 2700 IYR=IYR-1                                                             1822
      WRITE(6,2710) IYR1,IYR                                                1823
 2710 FORMAT (/ 33H AVERAGES FOR PERIOD OF OPERATION  I5,2H - I5)           1824
                                                                            1825
      DO 2780 MX=1,NCPT                                                     1826
      M=ICPT(MX)                                                            1827
      WRITE (6,1010)                                                        1828
      WRITE (6,2580) M, (CPT(M,K),K=1,8)                                    1829
      WRITE (6,1010)                                                        1830
      WRITE (6,2130) SQL(M)                                                 1831
      WRITE (6,2140) SPRE(M)                                                1832
      ID=IDIV(M)                                                            1833
      IF(ID,NE,0,OR,IRES(M),GT,0) WRITE(6,2160)SQI(M)                       1834
      IF(ID) 2720,2740,2730                                                 1835
 2720 ID= (-ID)                                                             1836
C                                  BRANCH TO  2730 FROM  2710,11            1837
 2730 WRITE (6,2200) SDV(ID)                                                1838
      WRITE (6,2210) SDVA(ID)                                               1839
      WRITE (6,2220) SSHD(ID)                                               1840
C                                  BRANCH TO  2740 FROM  2710,11            1841
 2740 IF (IRES(M),LE,0) GO TO 2770                                          1842
      WRITE (6,2310) SEVP(M)                                                1843
      IF (IPWR(M),LE,0) GO TO 2770                                          1844
      IP=IPWR(M)                                                            1845
      IF(IPWR=,LE,0) GO TO 2750                                             1846
      TEMP=SPR(IP)/(,024*SYDYS)                                             1847
      WRITE (6,2340) TEMP                                                   1848
      TEMP=SPWR(IP)/(,024*SYDYS)                                            1849
      WRITE (6,2360) TEMP                                                   1850
      TEMP=SSHP(IP)/(,024*SYDYS)                                            1851
      WRITE (6,2370) TEMP                                                   1852
      GO TO 2760                                                            1853
C                                  BRANCH TO  2750 FROM  2740,04            1854
 2750 WRITE (6,2390) SPR(IP)                                                1855
      IF(ISYSR(M),GT,0)WRITE(6,2350)ISYSR(M),SSP(IP)                        1856
      WRITE (6,2400) SPWR(IP)                                               1857
      WRITE (6,2370) SSHP(IP)                                               1858
C                                  BRANCH TO  2760 FROM  2740,11            1859
 2760 IF(IPOW(IP),LE,0) GO TO 2770                                          1860
      WRITE (6,2450) SPMX(IP)                                               1861
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C                                  BRANCH TO  2770 FROM  2740.00  2740.02 1862
C                                      2760.00                             1863
 2770 IF (IRES(M).GT.0) WRITE (6,2500) SCNS(M)                             1864
      WRITE (6,2510) SQA(M)                                                1865
      WRITE (6,2520) SQ(M)                                                 1866
      WRITE (6,2530) SSHQ(M)                                               1867
      IF(QM2(M).LE.0..AND.QM2(M).GT.(-.1)) GO TO 2780                      1868
      WRITE (6,2540) SQMN(M)                                               1869
      WRITE (6,2530) SSH2(M)                                               1870
C                                  BRANCH TO  2780 FROM  2710.02  2770.04 1871
 2780 CONTINUE                                                             1872
      IF(IUPDT.GT.0) GO TO 1140                                            1873
C *M*       PRINT SHORTAGE INDEXES * * * * * * * * * * * * * * * * * * * * 1874
      IF (NDIV.LE.0) GO TO 2810                                            1875
      DO 2790 ID=1,NDIV                                                    1876
      DINDX(ID) = DINDX(ID)*100./RNYRS                                     1877
      IF(SDV(ID).LT..002.OR.RTIOD(ID).LT.0.)DINDX(ID)=-1.                  1878
C                                  BRANCH TO  2790 FROM  2780.03           1879
 2790 CONTINUE                                                             1880
      WRITE(6,2800)(IDV(ID),DINDX(ID),ID=1,NDIV)                           1881
 2800 FORMAT(/26H DIVERSION SHORTAGE INDEX 7(I6,F7.3)/(9(I6,F7.3)))        1882
C                                  BRANCH TO  2810 FROM  2780.02           1883
 2810 DO 2820 MX=1,NCPT                                                    1884
      M = ICPT(MX)                                                         1885
      QINDX(M) = QINDX(M)*100./RNYRS                                       1886
      IF(SQ(M).LT..002)QINDX(M)=-1.                                        1887
      Q2NDX(M) = Q2NDX(M)*100./RNYRS                                       1888
      IF(SQMN(M).LT..002)Q2NDX(M)=-1.                                      1889
C          SQMN AND SSH2 USED AS TEMPORARY VARIABLES                       1890
      SQMN(MX)=QINDX(M)                                                    1891
C                                  BRANCH TO  2820 FROM  2810.00           1892
 2820 SSH2(MX)=Q2NDX(M)                                                    1893
      IF (NPWR.LE.0) GO TO 2870                                            1894
      DO 2830 IP=1,NPWR                                                    1895
      PINDX(IP)=PINDX(IP)*100./RNYRS                                       1896
      IF(SPR(IP).LT..002)PINDX(IP)=-1.                                     1897
C                                  BRANCH TO  2830 FROM  2820.02           1898
 2830 CONTINUE                                                             1899
      WRITE(6,2840)(IPR(IP),PINDX(IP),IP=1,NPWR)                           1900
 2840 FORMAT(/21H POWER SHORTAGE INDEX5X,7(I6,F7.3)/(9(I6,F7.3)))          1901
      IF (NPWRS.LE.0) GO TO 2870                                           1902
      DO 2850 IX=1,NPWRS                                                   1903
      MX=KPWR+IX                                                           1904
      PINDX(MX)=PINDX(MX)*100./RNYRS                                       1905
C                                  BRANCH TO  2850 FROM  2840.02           1906
 2850 WRITE(6,2860)IX,PINDX(MX),NSRTP(IX),SYMSP(IX)                        1907
 2860 FORMAT(13H POWER SYSTEMI2,2X,14HSHORTAGE INDEXF7.3,                  1908
     .  17H NO. OF SHORTAGES I3,2X,16H MAX. SHORTAGE = F10.0)              1909
C                                  BRANCH TO  2870 FROM  2820.01  2840.01 1910
 2870 WRITE(6,2880)(ICPT(M),SQMN(M),M=1,NCPT)                              1911
 2880 FORMAT(/24H DES FLOW SHORTAGE INDEX2X,7(I6,F7.3)/(9(I6,F7.3)))       1912
      WRITE(6,2890)(ICPT(M),SSH2(M),M=1,NCPT)                              1913
 2890 FORMAT(/24H MIN FLOW SHORTAGE INDEX2X,7(I6,F7.3)/(9(I6,F7.3)))       1914
      WRITE(6,2900)                                                        1915
 2900 FORMAT(/5X, 98H DIVRSION SHORTAGES  DES FLOW SHORTAGES  MIN FLOW S   1916
     .HORTAGES  SYS PWR SHORTAGES  AT SITE PWR SHRTGS )                    1917
      WRITE(6,2910)                                                        1918
 2910 FORMAT(4H STA 5X,5(2X,9HNO    MAX 8X))                               1919
      DO 2950 MX=1,NCPT                                                    1920
      M=ICPT(MX)                                                           1921
      SHMX(M)=SHMX(M)*CSOUT(1)                                             1922
      SHMX2(M)=SHMX2(M)*CSOUT(1)                                           1923
      ID=IDIV(M)                                                           1924
      IF(ID.GT.0) GO TO 2930                                               1925
      WRITE(6,2920)M,NSHMN(M),SHMX(M),NSH2(M),SHMX2(M),NSHPS(M),           1926
     .            SPSMX(M),NSHP(M),SHPMX(M)                              1927
C                                  BRANCH TO  2920 FROM  2910.07           1928
 2920 FORMAT(I4,8X,1H-,6X,1H-,4(I12,F7.0))                                 1929
      GO TO 2950                                                           1930
C                                  BRANCH TO  2930 FROM  2910.06           1931
 2930 SHDMX(ID)=SHDMX(ID)*CSOUT(1)                                         1932
      WRITE(6,2940)M,NDVSH(ID),SHDMX(ID),NSHMN(M),SHMX(M),NSH2(M),         1933
```

```
     . SHMX2(M),NSHPS(M),SPSMX(M),NSHP(M),SHPMX(M)                          1934
C                                BRANCH TO  2940 FROM  2930.01             1935
 2940 FORMAT(I4,I9,F7.0,4(I12,F7.0))                                        1936
C                                BRANCH TO  2950 FROM  2910.01  2920.01    1937
 2950 CONTINUE                                                              1938
      DO 2980 MX=1,NCPT                                                     1939
      M=ICPT(MX)                                                            1940
      IF(IRES(M).LE.0) GO TO 2980                                           1941
C *N*          STORAGE FREQUENCY                                           1942
      WRITE(6,2960) NYRS,M,(APERD(I),APRD(I),I=1,NPER)                      1943
 2960 FORMAT(/22H STORAGE FREQUENCY PER I3,18H YEARS AT LOCATION I3/        1944
     .  11H CONS POOL ,28A4)                                                1945
      WRITE(6,2970)((NSTOR(I,M,K),I=1,12),K=1,10)                           1946
 2970 FORMAT(11H 99-100 PCT 12I8/11H 95- 99 PCT 12I8/11H 90- 95 PCT 12I8    1947
     .      /11H 80- 90 PCT 12I8/11H 70- 80 PCT 12I8/11H 60- 70 PCT 12I8    1948
     .      /11H 40- 60 PCT 12I8/11H 20- 40 PCT 12I8/11H  1- 20 PCT 12I8    1949
     .      /11H  0- 1  PCT 12I8)                                           1950
C                                BRANCH TO  2980 FROM  2950.01  2950.03    1951
 2980 CONTINUE                                                              1952
      END FILE 3                                                            1953
      IF(IECON.GT.0) CALL ECON                                              1954
      IF(ISMRY.LE.0)GO TO 1020                                              1955
      END FILE 1                                                            1956
      END FILE 4                                                            1957
      CALL REARNG                                                           1958
      GO TO 1020                                                            1959
      END                                                                   1960
```

```
      BLOCK DATA                                                          1961
      COMMON/DTADM/                                                       1962
     . KCPT,KPWR,KPWRS,KRES,KUPST,KDIV,KL,KPER,KQIL,KSERV,KUPQI           1963
      COMMON/DTAIN/                                                       1964
     . PUNIT(6),BLNK,IBLK,FLWU,VOLU,FLMT,VLMT,AMOS(12),KDAYS(12),         1965
     . INUM(10),LTRJ,LTRC,IKODE(24),KODE(13),FIRST,LTDP                   1966
C      ********************************************************         1967
C      * CHANGE DIMENSIONS TO VARIABLES IN COMMON/DTARG/ TO ALLOW  *      196A
C      * ENOUGH SPACE FOR THE FORMAT SPECIFICATION ASSIGNED IN THE  *      1969
C      * DATA STATEMENT BELOW                                      *      1970
C      ********************************************************         1971
      COMMON/DTARG/                                                       1972
     . IZERO(3),IONE(3),ITWO(3),JZERO(3),JONE(3),JTWO(3),                 1973
     . KZERO(3),KONE(3),KTWO(3),NFMT(3)                                   1974
      LOGICAL FIRST                                                       1975
      DATA KCPT,KPWR,KPWRS,KRES,KUPST,KDIV,KL,KPER,KQIL,KSERV,KUPQI       1976
     .  /   40,  20,   2,   30,   18,  25, 8,  12,  90,   19,   10 /      1977
      DATA PUNIT/4HKILO,4HWATT,4HS   ,4HTHOU,4HSAND,4H KWH/               1978
      DATA BLNK/4H    /,IBLK/4H    /                                      1979
      DATA FLWU/4H CFS/, VOLU/4HACFT/, FLMT/4HM3/S/, VLMT/4HK M3/         1980
      DATA AMOS/4H JAN,4H FEB,4H MAR,4H APR,4H MAY,4H JUN,4H JUL,4H AUG,  1981
     . 4H SEP,4H OCT,4H NOV,4H DEC/                                       1982
      DATA KDAYS/31,28,31,30,31,30,31,31,30,31,30,31/                     1983
      DATA INUM/1H1,1H2,1H3,1H4,1H5,1H6,1H7,1H8,1H9,1H /                  1984
      DATA LTRJ/1HJ/,LTRC/1HC/,LTDP/2HDP/                                 1985
      DATA IKODE/2HCP,2HID,2HLF,2HEC,2HSV,2HDV,2HDS,2HQD,2HQR,2HQM,       1986
     .           2HR1,2HRL,2HRS,2HRA,2HRQ,2HRE,2HP1,2HPR,2HPQ,2HPT,       1987
     .           2HPP,2HPS,2HPE,2HED/                                     1988
      DATA KODE/ 2HIN,2HYE,2HEV,2HYD,2HYP,2HYS,2HYQ,2HYL,2HBN,2HBP,       1989
     .           2HBV,2HT1,2HER/                                          1990
      DATA FIRST/.TRUE./                                                  1991
C        CARDS 1992-2011 DELETED
      DATA NFMT  /24H(9H+   SUM  ,14F8.0)       /                      A2012
      DATA KTWO  /24H(9H+AVERAGE ,14F8.2)       /                      A2013
      DATA KONE  /24H(9H+AVERAGE ,14F8.1)       /                      A2014
      DATA KZERO /24H(9H+AVERAGE ,14F8.0)       /                      A2015
      DATA JTWO  /24H(1H ,119X,F8.2)            /                      D2016
      DATA JONE  /24H(1H ,119X,F8.1)            /                      D2017
      DATA JZERO /24H(1H ,119X,F8.0)            /                      D2018
      DATA ITWO  /24H(1H+,I6,2X,14F8.2          /                      A2019
      DATA IONE  /24H(1H+,I6,2X,14F8.1          /                      A2020
      DATA IZERO /24H(1H+,I6,2X,14F8.0          /                      A2021
      END                                                                 2022
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      SUBROUTINE INOUT                                                      2023
      DIMENSION ICRD(20),IBR(40),LSV(8),NTSRV(40),ITSRV(30,40)              2024
      COMMON/DTADM/                                                         2025
     . KCPT,KPWR,KPWRS,KRES,KUPST,KDIV,KL,KPER,KOIL,KSERV,KUPQI             2026
      COMMON/DTAIN/                                                         2027
     . PUNIT(6),BLNK,IBLK,FLWU,VOLU,FLMT,VLMT,AMOS(12),KDAYS(12),           2028
     . INUM(10),LTRJ,LTRC,IKODE(24),KODE(13),FIRST,LTDP                     2029
      COMMON/IN/                                                            2030
     . CACFT,CCFS,CSTI(12),CSTO(12),DINDX(25),IFLOW,IPRL,IPRNT,             2031
     . IPWYR,ISERV(30,19),ISMRY,ISTOR(12),IUNIT,IUPDT,                      2032
     . IUPQI(40,10),IYR,JUPQI,MQ(90),NDYYR,NFLOW,NLYR,NSERV(30),            2033
     . NQYR,NUPQI(40),PINDX(22),QINDX(40),QMIN(12,40),Q2NDX(40),            2034
     . RTIO(90),SCNS(40),SDV(25),SDVA(25),SEVP(30),SPMX(22),SPR(22),        2035
     . SPRE(40),SPWR(22),SQ(40),SQA(40),SQI(40),SQL(40),SQMN(40),           2036
     . SSHD(25),SSHP(22),SSHQ(40),SSH2(40),SSP(22),STOR1(30),TMPR(12)       2037
     . ,CSOUT(12)                                                           2037.1
      COMMON /ALPHA/                                                        2038
     . APERD(12),APRD(12),IDIV(40),IPWR(40),IYR1,NPWR,NRES,QM2(40),         2039
     . TITLE(60),IPWKW                                                      2040
      COMMON /BETA/                                                         2041
     . NYRS,IRG(10),CPT(40,8),ICPT(40),IRES(40),NCPT,NPER,QUNIT,VUNIT       2042
      COMMON/DLTA1/                                                         2043
     . CNTRL(12,40),QL(12,40),SYQI(40),QI(12,40),STORB(12,30),              2044
     . ELEV(12,30),SYEVP(30),EVP(12,30),SYPWR(22),POWER(12,22),             2045
     . SYSHP(22),SHRTP(12,22),SYPMX(22),POWRP(12,20),SYQA(40),QA(12,40)     2046
      COMMON/DLTA2/                                                         2047
     . ANDYS,AREA(30,10),CEVAP(30),CFLOD,CLOCL,CONST,CQDEL(20,10),          2048
     . EFCY(30,10),EFFCY(20),EFY(20),EL(30,10),EVAPO(12),HEAD(20),ICONS,    2049
     . ICSE(12,40),IDBAS(25),IDGST,IDPR(20),IDV(25),IDVPR,IDVSP,IEVYR,      2050
     . IPER(12),IPERA,IPOW(20),IPR(20),IPRN(40),IPWPR,IRESP(2,20),          2051
     . ISHDV(25),ISHQ(40),ISHR(30),ISPER,ISRCH(40),ISYSR(40),               2052
     . IUPST(40,18),METRC,NCYCL,NDAYS(12),NDIV,NDIVR(40),NDVSH(25),         2053
     . NFLW(40),NL,NLF,NPWRS,NRESM,NRESP(2),NSH2(40),NSHDV,NSHMN(40),       2054
     . NSHP(40),NSHP3(40),NSHQ,NSHR,NSPER,NSRTP(2),NUPST(40),OVLOD(20)      2055
      COMMON/DLTA3/                                                         2056
     . PFMAX(20),PKPWR(20,10),POWR(12,20),PWER(12,22),PWRMX(20),            2057
     . PWRS(12,2),          QCAP(30,10),QCONS(12,40),QDIV(12,25),           2058
     . QDIVA(12,25),QDIVR(40),QDIVS(12,25),QLKG(40),QMAXA(40),              2059
     . QMIN2(12,40),QMINA(12,40),QMINS(12,40),QMX(12,40),QO(30,8),          2060
     . QOMN(30),QOT(40,8),          QPREP(12,40),QT(20,10),RSHDV,RSHQ,      2061
     . RTIOD(25),SHDIV(12,25),SHDMX(25),SHMX(40),SHMX2(40),SHPMX(40),       2062
     . SHRT2(12,40),SHRTQ(12,40),SPSMX(40),STOR(30,10),STORA(30),           2063
     . STRAV(30),STRSH,SYCNS(40),SYDV(25),SYDVA(25),SYDYS,SYMSP(2),         2064
     . SYPR(22),SYPRE(40),SYQ(40),SYQL(40),SYQMN(40),SYSH2(40),             2065
     . SYSHD(25),SYSHQ(40),SYSP(22),SYSSP(12,20),SYSYS(22),TL(20,10),       2066
     . TLWEL(20),                                                           2067
     . IDIVF(40),NDIVF(40),IDCPT(40),IDSHT(40),DFUNC(20,40),DPARA(20,40)    2068
      COMMON /BALT/                                                         2069
     . IECON,IE(8,40),IYEAR,NRESR(40),NSTOR(12,40,10),QII(12,40),           2070
     . STORL(12,40,8),TMPP(40),TMPX(12)                                     2071
      COMMON /GAMMA/                                                        2072
     . IRESM(40,30),IDIVR(40,25), IEV(40)                                   2073
C                                                                           2074
      LOGICAL FIRST                                                         2075
      EQUIVALENCE(NTSRV(1),NSTOR(1,1,1)), (ITSRV(1,1),NSTOR(1,6,1))         2076
C ***                                                                       2077
C                                  BRANCH TO  3000 FROM  4430,01  4530,03   2078
 3000 FORMAT(1H )                                                           2079
      CLOCL=1.                                                              2080
      CFLOD=1.                                                              2081
      IUNIT=0                                                               2082
      METRC=0                                                               2083
      CNSTI=1.                                                              2084
      CNSTO=1.                                                              2085
      CCFS=1.                                                               2086
      QUNIT=FLWU                                                            2087
      CACFT=1.                                                              2088
      VUNIT=VOLU                                                            2089
      IPRNT=0                                                               2090
      IPRL=0                                                                2091
      IPWKW=0                                                               2092
      IUPDT=0                                                               2093
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      IDGST=0                                                                  2094
      ISMRY=0                                                                  2095
      IECON=0                                                                  2096
      NPER=12                                                                  2097
      IPERA=1                                                                  2098
      DO 3010 I=1,12                                                           2099
      APERD(I)=BLNK                                                            2100
      APRD(I)=AMOS(I)                                                          2101
      NDAYS(I)=KDAYS(I)                                                        2102
      EVAPD(I)=0.                                                              2103
      CSOUT(I)=1.                                                              2103.1
C                                BRANCH TO  3010 FROM  3000.20                2104
 3010 CONTINUE                                                                 2105
      IEVYR=1                                                                  2106
      IPWYR=1                                                                  2107
      NPWRS=0                                                                  2108
      IX=0                                                                     2109
      ICNT=0                                                                   2110
      ILST=0                                                                   2111
C *B*                                                                          2112
      IF(.NOT.FIRST)GO TO 3030                                                 2113
C                                          **CARD T1**                         2114
      READ(5,3020) TITLE                                                       2115
C                                BRANCH TO  3020 FROM  3030.00  3040.00       2116
 3020 FORMAT(2X,A2,19A4)                                                       2117
      FIRST=.FALSE.                                                            2118
      GO TO 3050                                                               2119
C                                BRANCH TO  3030 FROM  3010.07                2120
 3030 READ(2,3020)(TITLE(I),I=1,20)                                            2121
      IF(EOF,2) 4920,3040                                                      2122
 3040 READ(2,3020)(TITLE(I),I=21,60)                                           2123
C                                BRANCH TO  3050 FROM  3020.02                2124
 3050 WRITE(6,3060)                                                            2125
 3060 FORMAT(1H1,30(1H*)/31H * RESERVOIR SYSTEM ANALYSIS  */                   2126
     . 31H * 723-X6-L2030   1 JULY 1974 */1X,30(1H*))                          2127
      WRITE(6,3070) TITLE                                                      2128
 3070 FORMAT(/(20X,A2,19A4))                                                   2129
C                                          **CARD J1**                         2130
      READ (5,3080) NYRS,IYR,NL,ICONS,IDVSP,IPWPR,IDVPR,IFLOW,JUPQI            2131
      WRITE(6,3090)NYRS,IYR,NL,ICONS,IDVSP,IPWPR,IDVPR,IFLOW,JUPQI             2132
C                                BRANCH TO  3080 FROM  3070.01  3260.00       2133
C                                    3270.00  3280.00  3310.00  3610.04       2134
C                                    3790.00  3800.00  3820.00               2135
 3080 FORMAT(2X,I6,9I8)                                                        2136
C                                BRANCH TO  3090 FROM  3070.02                2137
 3090 FORMAT(/54H  NYRS    IYR     NL ICONS IDVSP IPWPR IDVPR IFLOW JUPQI     2138
     .  /9I6)                                                                  2139
C                                BRANCH TO  3100 FROM  3120.08  3160.01       2140
 3100 READ (5,3110) ICD,IBRN,ICRD                                              2141
C                                BRANCH TO  3110 FROM  3120.06                2142
 3110 FORMAT(2A1,A2,19A4)                                                      2143
      ICNT=ICNT+1                                                              2144
      DO 3120 I=1,10                                                           2145
      IF(IBRN.EQ.INUM(I)) GO TO 3130                                           2146
C                                BRANCH TO  3120 FROM  3110.02                2147
 3120 CONTINUE                                                                 2148
      I=10                                                                     2149
      IBR(ICNT)=10                                                             2150
      IF(ICD.EQ.LTRC)GO TO 3140                                                2151
      IF(ILST.EQ.I)ICNT=ICNT-1                                                 2152
      IBR(ICNT)=6                                                              2153
      WRITE(4 ,3110)ICD,IBRN,ICRD                                              2154
      ILST=10                                                                  2155
      GO TO 3100                                                               2156
C                                BRANCH TO  3130 FROM  3110.03                2157
 3130 IF(ILST.EQ.I)ICNT=ICNT-1                                                 2158
      IBR(ICNT)=I                                                              2159
      IF(I.EQ.10) IBR(ICNT)=6                                                  2160
C                                BRANCH TO  3140 FROM  3120.03                2161
 3140 WRITE(4 ,3150) ICRD                                                      2162
C                                BRANCH TO  3150 FROM  3660.00  3670.02       2163
 3150 FORMAT(2X,A2,19A4)                                                       2164
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 3160 ILST=IBR(ICNT)                                                    2165
      IF(ICD.EQ.LTRJ)GO TO 3100                                         2166
      ENDFILE 4                                                         2167
      REWIND 4                                                          2168
      ICNT=0                                                            2169
      JBRN=0                                                            2170
C                                BRANCH TO  3170 FROM  3190,01  3240,00 2171
C                                    3250,01  3260,01  3270,02  3280,02 2172
C                                    3300,02  3310,01  3320,02  3330,03 2173
 3170 ICNT=ICNT+1                                                       2174
      IBRN=IBR(ICNT)                                                    2175
      GO TO (3180,3200,3260,3270,3280,3290,3310,3320,3330,3340),IBRN    2176
 3180 PRINT 3190                                                        2177
 3190 FORMAT(34H EXTRA CARD READ, HAS BEEN IGNORED)                     2178
      GO TO 3170                                                        2179
C                                          **CARD J2**                 2180
C                                BRANCH TO  3200 FROM  3170,02         2181
 3200 READ(4 ,3210)CLOCL,CFLOD,IUNIT,METRC,CNSTI,CNSTO,CCFS,QUNIT,      2182
     . CACFT,VUNIT                                                      2183
 3210 FORMAT(2F8.0,2I8,3F8.0,4X,A4,F8.0,4X,A4)                          2184
      IF(CLOCL.LE.0.) CLOCL=1.                                          2185
      IF(CFLOD.LE.0.) CFLOD=1.                                          2186
      IF(IUNIT.GT.0)GO TO 3225                                          2187
      CCFS=1.                                                           2188
      CACFT=1.                                                          2189
      QUNIT=FLWU                                                        2190
      VUNIT=VOLU                                                        2191
C                                BRANCH TO  3220 FROM  3210,03         2192
 3220 IF(METRC.LE.0)GO TO 3225                                          2193
      QUNIT=FLMT                                                        2194
      VUNIT=VLMT                                                        2195
C                                BRANCH TO  3225 FROM  3220,00  3220,01 2196
 3225 IF(CNSTI)3240,3230,3240                                           2197
 3230 CNSTI=1.                                                          2198
C                                BRANCH TO  3240 FROM  3220,00         2199
 3240 IF(CNSTO)3170,3250,3170                                           2200
 3250 CNSTO=1.                                                          2201
      GO TO 3170                                                        2202
C                                          **CARD J3**                 2203
C                                BRANCH TO  3260 FROM  3170,02         2204
 3260 READ(4 ,3080) IPRNT,IPRL,IPWKW,IUPDT,IDGST                        2205
      GO TO 3170                                                        2206
C                                          **CARD J4**                 2207
C                                BRANCH TO  3270 FROM  3170,02         2208
 3270 READ(4 ,3080) (IRG(I),I=1,10)                                     2209
      ISMRY=1                                                           2210
      GO TO 3170                                                        2211
C                                          **CARD J5**                 2212
C                                BRANCH TO  3280 FROM  3170,02         2213
 3280 READ(4 ,3080) NPER,IPERA                                          2214
      IF(NPER.LE.0)NPER=12                                              2215
      IF(IPERA.LE.0)IPERA=1                                             2216
      JBRN=JBRN+1                                                       2217
      GO TO 3170                                                        2218
C                                          **CARD J6**                 2219
C                                BRANCH TO  3290 FROM  3170,02         2220
 3290 READ(4 ,3300) (APERD(I),APRD(I),I=1,NPER)                         2221
 3300 FORMAT(20A4)                                                      2222
      JBRN=JBRN+2                                                       2223
      GO TO 3170                                                        2224
C                                          **CARD J7**                 2225
C                                BRANCH TO  3310 FROM  3170,02         2226
 3310 READ(4 ,3080) (NDAYS(I),I=1,NPER)                                 2227
      GO TO 3170                                                        2228
C                                          **CARD J8**                 2229
C                                BRANCH TO  3320 FROM  3170,02         2230
 3320 READ(4 ,3325)(EVAPD(I),I=1,NPER)                                  2231
C                                BRANCH TO  3325 FROM  3320,00  3330,01 2232
C                                    3810,03  3810,04  3820,03  3820,04 2233
C                                    3830,00  3840,00  3850,00  3990,00 2234
C                                    4000,00  4010,00  4020,00  4050,00 2235
C                                    4060,00  4070,00  4080,00  4090,00 2236
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C                                     4100.00                                   2237
 3325 FORMAT(10F8.0)                                                            2238
      IEVYR=0                                                                   2239
      GO TO 3170                                                                2240
C                                BRANCH TO  3330 FROM  3170.09                  2241
 3330 IX=IX+1                                                                   2242
C                                                 **CARD J9**                   2243
      READ(4 ,3325) (PWRS(I,IX),I=1,NPER)                                       2244
      NPWRS=IX                                                                  2245
      GO TO 3170                                                                2246
C                                BRANCH TO  3340 FROM  3170.02                  2247
 3340 IF(JBRN.NE.1) GO TO 3370                                                  2248
      IF(IPERA.EQ.1)GO TO 3370                                                  2249
C     ARRANGE MONTHS AND DAYS ACCORDING TO IPERA                                2250
      K=0                                                                       2251
      JJ=IPERA-2                                                                2252
      TEMP=APRD(1)                                                              2253
      ITMP=NDAYS(1)                                                             2254
      DO 3360 I=IPERA,NPER                                                      2255
      K=K+1                                                                     2256
      JK=I                                                                      2257
      APRD(K)=APRD(I)                                                           2258
      NDAYS(K)=NDAYS(I)                                                         2259
C =C=                                                                           2260
      IF(JJ.EQ.0) GO TO 3360                                                    2261
      DO 3350 J=1,JJ                                                            2262
      APRD(JK)=APRD(JK-1)                                                       2263
      NDAYS(JK)=NDAYS(JK-1)                                                     2264
      JK=JK-1                                                                   2265
C                                BRANCH TO  3350 FROM  3340.12                  2266
 3350 CONTINUE                                                                  2267
C                                BRANCH TO  3360 FROM  3340.06  3340.11        2268
 3360 CONTINUE                                                                  2269
      K=K+1                                                                     2270
      APRD(K)=TEMP                                                              2271
      NDAYS(K)=ITMP                                                             2272
C                                BRANCH TO  3370 FROM  3340.00  3340.01        2273
 3370 WRITE(6,3380)CLOCL,CFLOD,IUNIT,METRC,CNSTI,CNSTO,CCFS,QUNIT,              2274
     .  CACFT,VUNIT,IPRNT,IPRL,IPWKW,IUPDT,IDGST                                2275
C                                BRANCH TO  3380 FROM  3370.00                  2276
 3380 FORMAT(/52H CLOCL CFLOD IUNIT METRC   CNSTI      CNSTO       CCFS         2277
     .  50H QUNIT   CACFT VUNIT IPRNT  IPRL IPWKW IUPDT IDGST                   2278
     .  /2F6.2,2I6,2F10.3,F8.3,2X,A4,F8.3,2X,A4,5I6)                            2279
      CONST=1.98346                                                             2280
      IF(METRC.GT.0)CONST=86.4                                                  2281
      IF(ISMRY.LE.0) GO TO 3400                                                 2282
      WRITE(6,3390)(I,IRG(I),I=1,10)                                            2283
 3390 FORMAT(/9(5H IRG(I1,2H)=,I2,1H ),5H IRG(I2,2H)=,I2)                       2284
C                                BRANCH TO  3400 FROM  3380.05                  2285
 3400 WRITE(6,3410)NPER,IPERA                                                   2286
 3410 FORMAT(/6H NPER=I3,8H  IPERA=I4)                                          2287
      WRITE (6,3420) (APERD(I),APRD(I),I=1,NPER)                                2288
 3420 FORMAT(/7H PERIOD 4X,28A4)                                                2289
      WRITE(6,3430)(NDAYS(I),I=1,NPER)                                          2290
 3430 FORMAT (6H NDAYS  5X,(14I8))                                              2291
      K=0                                                                       2292
      DO 3490 I=1,NPER                                                          2293
      IPER(I) = IPERA+I-1                                                       2294
      IF (IPER(I).GT.NPER) IPER(I)=IPER(I)-NPER                                 2295
      ANDYS = NDAYS(I)                                                          2296
      K=K+NDAYS(I)                                                              2297
      CSTI(I) = 1.                                                              2298
      IF(CNSTI)3440,3460,3450                                                   2299
 3440 CSTI(I) = (-CNSTI)/(CONST*ANDYS)                                          2300
      GO TO 3460                                                                2301
C                                BRANCH TO  3450 FROM  3430.08                  2302
 3450 CSTI(I) = CNSTI                                                           2303
C                                BRANCH TO  3460 FROM  3430.08  3440.01        2304
 3460 CSTO(I) = 1.                                                              2305
      IF(CNSTO) 3470,3485,3480                                                  2306
 3470 CSTO(I) = (-CNSTO)/(CONST*ANDYS)                                          2307
      GO TO 3485                                                                2308
```

```
C                                  BRANCH TO  3480 FROM  3460.01                2309
 3480 CSTO(I) = CNSTO                                                          2310
 3485 IF(IUNIT.LE.0) GO TO 3490                                                2310.1
      CSOUT(I)=CCFS                                                            2310.2
      IF(CCFS.GT.0.) GO TO 3490                                                2310.3
      CSOUT(I)=CONST*ANDYS*(-CCFS)                                             2310.4
C                                  BRANCH TO  3490 FROM  3430.02  3460.01      2311
C                                      3470.01                                 2312
 3490 CONTINUE                                                                 2313
      SYDYS = K                                                                2314
      IF(IUNIT.GT.0.AND.CCFS.LE.0.) CCFS=CONST*SYDYS*(-CCFS)                   2314.1
      NCYCL=2                                                                  2315
      IF(IEVYR)3530,3500,3530                                                  2316
 3500 WRITE(6,3510)(EVAPO(I),I=1,NPER)                                         2317
 3510 FORMAT (6H EVP  5X,(14F8.2))                                             2318
      DO 3520 I=1,NPER                                                         2319
      IF (EVAPO(I).GT..01) GO TO 3530                                          2320
C                                  BRANCH TO  3520 FROM  3510.01               2321
 3520 CONTINUE                                                                 2322
C                                  BRANCH TO  3530 FROM  3490.03  3510.02      2323
 3530 IF(NPWRS.LE.0)GO TO 3560                                                 2324
      DO 3540 IX=1,NPWRS                                                       2325
 3540 WRITE(6,3550) IX,(PWRS(I,IX),I=1,NPER)                                   2326
 3550 FORMAT(4H SYS,I2,5H PWRS,14F8.1)                                         2327
C                                  BRANCH TO  3560 FROM  3530.00               2328
 3560 NLF=2                                                                    2329
      IF(IFLOW.GT.0.OR.IPRNT.LE.(-1))IPNT=-1                                   2330
      DO 3570 M=1,KRES                                                         2331
      NSERV(M)=0                                                               2332
C                                  BRANCH TO  3570 FROM  3560.02               2333
 3570 IPWR(M)=0                                                                2334
      NCPT=0                                                                   2335
      NRES=0                                                                   2336
      NDIV=0                                                                   2337
      NPWR=0                                                                   2338
C -D-                                                                          2339
      DO 3580 M=1,KCPT                                                         2340
      NUPQI(M)=0                                                               2341
C                                  BRANCH TO  3580 FROM  3570.05               2342
 3580 NUPST(M)=0                                                               2343
      DO 3590 IX=1,KPWRS                                                       2344
 3590 NRESP(IX)=0                                                              2345
      KX=0                                                                     2346
      IP=0                                                                     2347
      WRITE(6,3600)                                                            2348
 3600 FORMAT(/23H CONTROL POINT SEQUENCE )                                     2349
C                                  BRANCH TO  3610 FROM  4660.00               2350
 3610 MDIV=0                                                                   2351
      MRES=0                                                                   2352
      MPWR=0                                                                   2353
      NTS=0                                                                    2354
C                                          **CARD CP**                          2355
      READ(4 ,3080) M,MDNST,ITMP                                               2356
      IF(M.GT.KCPT.OR.MDNST.GT.KCPT) GO TO 4900                                2357
      NCPT=NCPT+1                                                              2358
      ICPT(NCPT)=M                                                             2359
      IPRN(M)=ITMP                                                             2360
      REWIND 4                                                                 2361
      ILST=0                                                                   2362
      K=0                                                                      2363
      JL=0                                                                     2364
      INCLOF=JUPQI                                                             2365
C                                  BRANCH TO  3620 FROM  3650.01  3670.05      2366
C                                      3680.00  3680.05  3690.01               2367
 3620 READ (5,3630) ICD,ICRD                                                   2368
C                                  BRANCH TO  3630 FROM  3670.01               2369
 3630 FORMAT(2A2,19A4)                                                         2370
      DO 3640 I=1,24                                                           2371
      IF(ICD.NE.IKODE(I)) GO TO 3640                                           2372
      IF(ILST.EQ.I) GO TO 3660                                                 2373
      IF(I.EQ.3) INCLOF=0                                                      2374
      K=K+1                                                                    2375
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```
      IBR(K)=I                                                          2376
      ILST=I                                                            2377
      GO TO 3660                                                        2378
C                                  BRANCH TO  3640 FROM  3630.01  3630.02 2379
 3640 CONTINUE                                                          2380
      PRINT 3650, ICD,ICRD                                              2381
C                                  BRANCH TO  3650 FROM  4750.00         2382
 3650 FORMAT(22H UNRECOGNIZABLE CARD# 2A2,19A4,9H, IGNORED)             2383
      GO TO 3620                                                        2384
C                                  BRANCH TO  3660 FROM  3630.03  3630.07 2385
 3660 WRITE(4 ,3150) ICRD                                               2386
      IF(I.EQ.12.AND.ICRD(2).NE.IBLK) JL=JL+1                           2387
      IF(I.EQ.1.OR.I.EQ.24) GO TO 3700                                  2388
      IF(I.NE.7) GO TO 3680                                             2389
      ITMP=0                                                            2390
C                                  BRANCH TO  3670 FROM  3670.03  3670.04 2391
 3670 ITMP=ITMP+1                                                       2392
      READ (5,3630) ICD,ICRD                                            2393
      WRITE(4, 3150) ICRD                                               2394
      IF(ITMP.EQ.1.OR.ITMP.EQ.3) GO TO 3670                             2395
      IF(ICD.NE.LTDP) GO TO 3670                                        2396
      GO TO 3620                                                        2397
C                                  BRANCH TO  3680 FROM  3660.03         2398
 3680 IF(I.NE.13) GO TO 3620                                            2399
      NTAB=10                                                           2400
      DO 3690 L=2,20,2                                                  2401
      IF(ICRD(L).NE.IBLK)GO TO 3690                                     2402
      NTAB=(L-2)/2                                                      2403
      GO TO 3620                                                        2404
C                                  BRANCH TO  3690 FROM  3680.02  3680.03 2405
 3690 CONTINUE                                                          2406
      GO TO 3620                                                        2407
C                                  BRANCH TO  3700 FROM  3660.02         2408
 3700 ENDFILE 4                                                         2409
      REWIND 4                                                          2410
      KBR=0                                                             2411
C                                  BRANCH TO  3710 FROM  3740.01  3750.01 2412
C                                      3780.01  3790.02  3800.02  3810.07 2413
C                                      3820.05  3830.02  3840.02  3850.02 2414
C                                      3870.02  3980.01  3990.01  4000.01 2415
C                                      4010.01  4020.01  4040.06  4050.02 2416
C                                      4060.01  4070.01  4080.01  4090.01 2417
C                                      4100.01                           2418
 3710 KBR=KBR+1                                                         2419
      IBRN=IBR(KBR)                                                     2420
C              CP   ID   LF   EC   SV   DV   DS   QD   QR   QM         2421
      GO TO (4110,3720,3760,3790,3800,3810,3820,3830,3840,3850,         2422
C              R1   RL   RS   RA   RQ   RE   P1   PR   PQ   PT         2423
     .       3860,3880,3990,4000,4010,4020,4030,4050,4060,4070,         2424
C              PP   PS   PE   ED                                        2425
     .       4080,4090,4100,4110),IBRN                                 2426
C                                                  **CARD ID**         2427
C                                  BRANCH TO  3720 FROM  3710.02         2428
 3720 READ(4 ,3730)QDV,QMN,QM2(M),QMXX,(CPT(M,I),I=1,8)                 2429
 3730 FORMAT(4F8.0,8A4)                                                 2430
      IF(QMXX.LE.0.)QMXX=999999.                                        2431
      DO 3740 I=1,NPER                                                  2432
      QMX(I,M)=QMXX                                                     2433
      QMIN(I,M) = QMN                                                   2434
C                                  BRANCH TO  3740 FROM  3730.01         2435
 3740 QMIN2(I,M)=QM2(M)                                                 2436
      IF(QDV.LE.0.) GO TO 3755                                          2437
      NDIV=NDIV+1                                                       2438
      IF(NDIV.GT.KDIV)GO TO 4900                                        2439
      MDIV=1                                                            2440
      DO 3750 I=1,NPER                                                  2441
      QDIV(I,NDIV)=QDV                                                  2442
C                                  BRANCH TO  3750 FROM  3740.05         2443
 3750 CONTINUE                                                          2444
 3755 IF(INCLOF.LE.0) GO TO 3710                                        2445
      ITMP=1                                                            2446
      ICRD(1)=M                                                         2447
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      TMPP(1)=1.                                                        2448
      GO TO 3775                                                        2449
C                                                   **CARD LF**       2450
C                                  BRANCH TO  3760 FROM  3710.02      2451
 3760 READ(4 ,3770)ITMP,(ICRD(I),TMPP(I),I=1,ITMP)                     2452
 3770 FORMAT(I8,4(I8,F8.0),I8/(5(F8.0,I8)))                            2453
 3775 NFLW(M)=ITMP                                                     2454
      DO 3780 I=1,ITMP                                                  2455
      KX=KX+1                                                           2456
      MQ(KX)=ICRD(I)                                                    2457
      RTIO(KX)=TMPP(I)                                                  2458
C                                  BRANCH TO  3780 FROM  3770.02      2459
 3780 CONTINUE                                                         2460
      GO TO 3710                                                        2461
C                                                   **CARD EC**       2462
C                                  BRANCH TO  3790 FROM  3710.02      2463
 3790 READ(4 ,3080)(IE(I,M),I=1,8)                                     2464
      IECON=1                                                           2465
      GO TO 3710                                                        2466
C                                                   **CARD SV**       2467
C                                  BRANCH TO  3800 FROM  3710.02      2468
 3800 READ(4,3080) NTS,(ITSRV(M,I),I=1,NTS)                            2469
      NTSRV(M)=NTS                                                      2470
      GO TO 3710                                                        2471
C                                  BRANCH TO  3810 FROM  3710.02      2472
 3810 IF(MDIV.LE.0) NDIV=NDIV+1                                        2473
      IF(NDIV.GT.KDIV) GO TO 4900                                       2474
      MDIV=1                                                            2475
C                                                   **CARD DV**       2476
      READ(4 ,3325)(QDIV(I,NDIV),I=1,10)                                2477
      IF(QDIV(2,NDIV).GE.0..AND.NPER.GT.10)                             2478
     .     READ(4,3325)(QDIV(I,NDIV),I=11,NPER)                        2479
      QDV=1.                                                            2480
      GO TO 3710                                                        2481
C                                                   **CARD DS**       2482
C                                  BRANCH TO  3820 FROM  3710.02      2483
 3820 READ(4 ,3080) IDIVF(M),NDIVF(M),IDCPT(M),IDSHT(M)                2484
      IF(IDCPT(M).LE.0) IDCPT(M)=M                                      2485
      ITMP=NDIVF(M)                                                     2486
      READ(4 ,3325) (DFUNC(I,M),I=1,ITMP)                               2487
      READ(4 ,3325) (DPARA(I,M),I=1,ITMP)                               2488
      GO TO 3710                                                        2489
C                                                   **CARD QD**       2490
C                                  BRANCH TO  3830 FROM  3710.02      2491
 3830 READ(4 ,3325)(QMIN(I,M),I=1,NPER)                                2492
      QMN=1.                                                            2493
      GO TO 3710                                                        2494
C                                                   **CARD QR**       2495
C                                  BRANCH TO  3840 FROM  3710.02      2496
 3840 READ(4 ,3325)(QMIN2(I,M),I=1,NPER)                               2497
      QM2(M)=1.                                                         2498
      GO TO 3710                                                        2499
C                                                   **CARD QM**       2500
C                                  BRANCH TO  3850 FROM  3710.02      2501
 3850 READ(4 ,3325)(QMX(I,M),I=1,NPER)                                 2502
      QMXX=1.                                                           2503
      GO TO 3710                                                        2504
C                                  BRANCH TO  3860 FROM  3710.02      2505
 3860 IF(M.GT.KRES) GO TO 4900                                         2506
C                                                   **CARD R1**       2507
      READ(4,3870) CEVAP(M),ATMP,QLKG(M),ISRCH(M)                       2508
 3870 FORMAT(3F8.0,7I8)                                                2509
      MRES=1                                                            2510
      GO TO 3710                                                        2511
C                                  BRANCH TO  3880 FROM  3710.02      2512
 3880 DO 3890 L=1,NL                                                   2513
 3890 LSV(L)=0                                                         2514
      DO 3960 N=1,JL                                                    2515
C                                                   **CARD RL**       2516
      READ(4,3900) L,MT,IRPT,FACTR,(STORL(I,M,L),I=1,6)                 2517
 3900 FORMAT(3I8,7F8.0)                                                2518
      LSV(L)=1                                                          2519
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      IF(FACTR.LE.0.) FACTR=1.                                                  2520
      IF(IRPT.GE.0) GO TO 3920                                                  2521
      TEMP=STORL(1,M,L)                                                         2522
      DO 3910 I=2,NPER                                                          2523
      STORL(I,M,L)=TEMP                                                         2524
C                                  BRANCH TO  3910 FROM  3900.05                2525
 3910 CONTINUE                                                                  2526
      GO TO 3940                                                                2527
C                                  BRANCH TO  3920 FROM  3900.03                2528
 3920 IF(NPER.LE.6) GO TO 3940                                                  2529
      READ(4,3930) (STORL(I,M,L),I=7,NPER)                                      2530
 3930 FORMAT(32X,6F8.0)                                                         2531
C                                  BRANCH TO  3940 FROM  3910.01  3920.00       2532
 3940 DO 3950 I=1,NPER                                                          2533
      STORL(I,M,L)=STORL(I,M,L)*FACTR                                           2534
C                                  BRANCH TO  3950 FROM  3940.00                2535
 3950 CONTINUE                                                                  2536
C                                  BRANCH TO  3960 FROM  3890.01                2537
 3960 CONTINUE                                                                  2538
      DO 3980 L=2,NL                                                            2539
      IF(LSV(L).EQ.1)GO TO 3980                                                 2540
      DO 3970 I=1,NPER                                                          2541
      STORL(I,M,L)=STORL(I,M,L-1)                                               2542
C                                  BRANCH TO  3970 FROM  3960.03                2543
 3970 CONTINUE                                                                  2544
C                                  BRANCH TO  3980 FROM  3960.01  3960.02       2545
 3980 CONTINUE                                                                  2546
      GO TO 3710                                                                2547
C                                                **CARD RS**                    2548
C                                  BRANCH TO  3990 FROM  3710.02                2549
 3990 READ(4 ,3325)(STOR(M,K),K=1,10)                                           2550
      GO TO 3710                                                                2551
C                                                **CARD RA**                    2552
C                                  BRANCH TO  4000 FROM  3710.02                2553
 4000 READ(4 ,3325)(AREA(M,K),K=1,10)                                           2554
      GO TO 3710                                                                2555
C                                                **CARD RQ**                    2556
C                                  BRANCH TO  4010 FROM  3710.02                2557
 4010 READ(4 ,3325)(QCAP(M,K),K=1,10)                                           2558
      GO TO 3710                                                                2559
C                                                **CARD RE**                    2560
C                                  BRANCH TO  4020 FROM  3710.02                2561
 4020 READ(4 ,3325)(EL(M,K),K=1,10)                                             2562
      GO TO 3710                                                                2563
C                                  BRANCH TO  4030 FROM  3710.02                2564
 4030 IP=IP+1                                                                   2565
C                                                **CARD P1**                    2566
      READ(4,4040) OVLOD(IP),PWRMX(IP),TLWEL(IP),IDPR(IP),IPOW(IP),             2567
     .  EFFCY(IP),MPSYS,PFMAX(IP)                                               2568
C                                  BRANCH TO  4040 FROM  4030.01                2569
 4040 FORMAT   (F8.0,2F8.0,2I8,F8.0,I8,F8.0)                                    2570
      NPWR=NPWR+1                                                               2571
      IF(NPWR.GT.KPWR) GO TO 4900                                               2572
      MPWR=1                                                                    2573
      IF(OVLOD(IP).LE.0.) OVLOD(IP)=1.15                                        2573.1
      IF(MPSYS.GT.NPWRS)NPWRS=MPSYS                                             2574
      IF(NPWRS.GT.KPWRS)GO TO 4900                                              2575
      GO TO 3710                                                                2576
C                                                **CARD PR**                    2577
C                                  BRANCH TO  4050 FROM  3710.02                2578
 4050 READ(4 ,3325)(POWR(I,IP),I=1,NPER)                                        2579
      IPWYR=0                                                                   2580
      GO TO 3710                                                                2581
C                                                **CARD PQ**                    2582
C                                  BRANCH TO  4060 FROM  3710.02                2583
 4060 READ(4 ,3325)(QT(IP,K),K=1,10)                                            2584
      GO TO 3710                                                                2585
C                                                **CARD PT**                    2586
C                                  BRANCH TO  4070 FROM  3710.02                2587
 4070 READ(4 ,3325)(TL(IP,K),K=1,10)                                            2588
      GO TO 3710                                                                2589
C                                                **CARD PP**                    2590
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C                                   BRANCH TO  4080 FROM  3710.02          2591
 4080 READ(4 ,3325)(PKPWR(IP,K),K=1,10)                                    2592
      GO TO 3710                                                           2593
C                                                 **CARD PS**              2594
C                                   BRANCH TO  4090 FROM  3710.02          2595
 4090 READ(4 ,3325)(CQOEL(IP,K),K=1,10)                                    2596
      GO TO 3710                                                           2597
C                                                 **CARD PE**              2598
C                                   BRANCH TO  4100 FROM  3710.02          2599
 4100 READ(4 ,3325) (EFCY(IP,K),K=1,10)                                    2600
      GO TO 3710                                                           2601
C                                   BRANCH TO  4110 FROM  3710.02          2602
 4110 WRITE(6,4120) M,(CPT(M,K),K=1,8)                                     2603
 4120 FORMAT(/1X,46(1H*)/8H * CP NO I4,1X,8A4,2H */1X,46(1H*))             2604
      WRITE(6,4130) MDNST,MDIV,MRES,MPWR,NTS,IPRN(M),                      2605
     . NFLW(M),QDV,QMN,QM2(M),QMXX                                         2606
C                                   BRANCH TO  4130 FROM  4120.01          2607
 4130 FORMAT(/ 36H MDNST  MDIV  MRES  MPWR NTSRV  IPRN                     2608
     .  38H  NFLW     QDV      QMN      QM2     QMXX /7I6,4F8.0)          2609
      IF(NFLW(M).LE.0) GO TO 4150                                          2610
      ITMP=NFLW(M)                                                         2611
      WRITE(6,4140)(ICRD(K),TMPP(K),K=1,ITMP)                              2612
 4140 FORMAT(13H MQ AND RTIO= 6(I8,F8.3))                                  2613
C                                   BRANCH TO  4150 FROM  4130.02          2614
 4150 IF(IECON.LE.0) GO TO 4170                                            2615
      WRITE(6,4160)(J,IE(J,M),J=1,8)                                       2616
 4160 FORMAT (/1X, 8(3HIF(I1,2H)=I2,2X))                                   2617
C                                   BRANCH TO  4170 FROM  4150.00          2618
 4170 IF(NTS.LE.0)GO TO 4190                                               2619
      WRITE(6,4180) (ITSRV(M,K),K=1,NTS)                                   2620
 4180 FORMAT( 7H ITSRV= ,30I4)                                             2621
      NTS=0                                                                2622
C =E=                               BRANCH TO  4190 FROM  4170.00          2623
 4190 IF(MRES.LE.0) GO TO 4200                                             2624
      IF(NRESR(M).LT.0)NRESR(M)=0                                          2625
      NRES=NRES+1                                                          2626
      IRES(M)=M                                                            2627
      ITMP=NRESR(M)+1                                                      2628
      NRESR(M)=ITMP                                                        2629
      IRESM(M,ITMP)=M                                                      2630
      IF(MDNST.LE.0) GO TO 4240                                            2631
      ITMP=NUPST(MDNST)+1                                                  2632
      NUPST(MDNST)=ITMP                                                    2633
      IUPST(MDNST,ITMP)=M                                                  2634
C                                   BRANCH TO  4200 FROM  4190.00          2635
 4200 IF(MDNST.LE.0)GO TO 4240                                             2636
      IF(MRES.GT.0.OR.JUPQI.LE.0) GO TO 4210                               2637
      ITP=NUPQI(MDNST)+1                                                   2638
      NUPQI(MDNST)=ITP                                                     2639
      IUPQI(MDNST,ITP)=M                                                   2640
      IF(ITP.GT.KUPQI) GO TO 4900                                          2641
C                                   BRANCH TO  4210 FROM  [illegible]      2642
 4210 ITP=NRESR(M)                                                         2643
      IF(NRESR(MDNST).LT.0)NRESR(MDNST)=0                                  2644
      ITMP=NRESR(MDNST)                                                    2645
      DO 4220 K=1,ITP                                                      2646
      IF(IRESM(M,K).LE.0)GO TO 4220                                        2647
      ITMP=ITMP+1                                                          2648
      IRESM(MDNST,ITMP)=IRESM(M,K)                                         2649
C                                   BRANCH TO  4220 FROM  4210.03          2650
 4220 CONTINUE                                                             2651
      NRESR(MDNST)=ITMP                                                    2652
      IF(MRES.GT.0)GO TO 4240                                              2653
      IF(MDNST.LE.0) GO TO 4240                                            2654
      ITP=NUPST(M)                                                         2655
      ITMP=NUPST(MDNST)                                                    2656
      DO 4230 K=1,ITP                                                      2657
      IF(IUPST(M,K).LE.0)GO TO 4230                                        2658
      ITMP=ITMP+1                                                          2659
      IUPST(MDNST,ITMP)=IUPST(M,K)                                         2660
C                                   BRANCH TO  4230 FROM  4220.06  4220.07 2661
 4230 CONTINUE                                                             2662
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      NUPST(MONST)=ITMP                                                 2663
C                                  BRANCH TO  4240 FROM  4190.07  4200.00 2664
C                                      4220.02  4220.03                 2665
 4240 IF(MDIV.LE.0) GO TO 4320                                          2666
      RTIOD(NDIV)=1.                                                    2667
      IDV(NDIV)=M                                                       2668
      IDIV(M)=NDIV                                                      2669
      ITP=NDIVR(M)+1                                                    2670
      NDIVR(M)=ITP                                                      2671
      IDIVR(M,ITP)=M                                                    2672
C =F=                                                                   2673
      IF(QDIV(2,NDIV).GE.-.0001) GO TO 4260                             2674
      IDIV(M)=-NDIV                                                     2675
      IDBAS(NDIV)=QDIV(1,NDIV)                                          2676
      RTIOD(NDIV)=QDIV(2,NDIV)                                          2677
      WRITE(6,4250)  RTIOD(NDIV),IDBAS(NDIV)                            2678
 4250 FORMAT(11H DIVERSION=F6.3,19H TIMES DIVERSION AT I3)              2679
      GO TO 4320                                                        2680
C                                  BRANCH TO  4260 FROM  4240.07         2681
 4260 IF(QDV.LT.(-.1)) WRITE(6,4270) (QDIV(I,NDIV),I=1,NPER)            2682
 4270 FORMAT(11H DIVERSION=14F8.1)                                      2683
      DO 4280 I=1,NPER                                                  2684
      QDIV(I,NDIV)=QDIV(I,NDIV)*CSTO(I)                                 2685
C                                  BRANCH TO  4280 FROM  4270.01         2686
 4280 QDIVS(I,NDIV)=QDIV(I,NDIV)                                        2687
      IF(IDIVF(M).LE.0) GO TO 4320                                      2688
      WRITE(6,4290) IDIVF(M),NDIVF(M),IDCPT(M),IDSHT(M)                 2689
 4290 FORMAT(27H DIVERSION FUNCTION= IDIVF= ,I2,3X6HNDIVF=,I3,3X6HIDCPT= 2690
     . ,I3,3X6HIDSHT=,I2)                                               2691
      ITMP=NDIVF(M)                                                     2692
      WRITE(6,4300) (DFUNC(I,M),I=1,ITMP)                               2693
 4300 FORMAT(11H DIVERSION 15F8.0)                                      2694
      WRITE(6,4310) (DPARA(I,M),I=1,ITMP)                               2695
 4310 FORMAT(11H PARAMETER 15F8.0)                                      2696
C                                  BRANCH TO  4320 FROM  4240.00  4250.01 2697
C                                      4280.01                           2698
 4320 IF(NDIVR(M).LE.0.OR.MRES.GT.0) GO TO 4340                         2699
      IF(MONST.LE.0) GO TO 4340                                         2700
      ITMP=NDIVR(MONST)                                                 2701
      ITEMP=NDIVR(M)                                                    2702
      DO 4330 K=1,ITEMP                                                 2703
      ITMP=ITMP+1                                                       2704
C                                  BRANCH TO  4330 FROM  4320.04         2705
 4330 IDIVR(MONST,ITMP)=IDIVR(M,K)                                      2706
      NDIVR(MONST)=ITMP                                                 2707
C                                  BRANCH TO  4340 FROM  4320.00  4320.01 2708
 4340 IF(MPWR.LE.0) GO TO 4350                                          2709
      IPWR(M)=NPWR                                                      2710
      IPR(NPWR)=M                                                       2711
C =G=      ESTABLISH BASIC MONTHLY FLOW REQUIREMENTS                    2712
C                                  BRANCH TO  4350 FROM  4340.00         2713
 4350 IF (QMN.GT.(-.1)) GO TO 4370                                      2714
      WRITE(6,4360)(QMIN(I,M),I=1,NPER)                                 2715
 4360 FORMAT(5H QMIN6X,14F8.0)                                          2716
C                                  BRANCH TO  4370 FROM  4350.00         2717
 4370 IF (QM2(M).GT.(-.1)) GO TO 4390                                   2718
      WRITE(6,4380)(QMIN2(I,M),I=1,NPER)                                2719
 4380 FORMAT(6H QMIN25X,14F8.0)                                         2720
C                                  BRANCH TO  4390 FROM  4370.00         2721
 4390 IF(QMXX.GT.(-.1))GO TO 4410                                       2722
      WRITE(6,4400)(QMX(I,M),I=1,NPER)                                  2723
 4400 FORMAT(4H QMX7X,14F8.0)                                           2724
C =G=       CONVERT TO CFS AND OBTAIN ANNUAL REQUIRED FLOW             2725
C                                  BRANCH TO  4410 FROM  4390.00         2726
 4410 DO 4420 I=1,NPER                                                  2727
      TMP=CSTO(I)                                                       2728
      QMX(I,M)=QMX(I,M)*TMP                                             2729
      QMIN(I,M) =QMIN(I,M)*TMP                                          2730
      QMIN2(I,M)= QMIN2(I,M)*TMP                                        2731
      IF(IFLOW.EQ.M)TMPR(I)=QMIN(I,M)                                   2732
C                                  BRANCH TO  4420 FROM  4410.00         2733
 4420 CONTINUE                                                          2734
```

```
      IF(MRES.LE.0)GO TO 4660                                                  2735
C =H=          RESERVOIR DATA                                                  2736
      ELEV(NPER,M)=0.                                                          2737
      IF (ATMP.LT.(=.1)) GO TO 4430                                            2738
      STORA(M) = ATMP                                                          2739
      STORB(NPER,M)=ATMP                                                       2740
C                                BRANCH TO  4430 FROM  4420.03                 2741
 4430 STOR1(M) = STORA(M)                                                      2742
      WRITE(6,3000)                                                            2743
      WRITE(6,4440)STOR1(M),CEVAP(M),QLKG(M),ISRCH(M)                          2744
 4440 FORMAT(/16H RESERVOIR DATA#//16H  INITTAL STOR =F9.0,9H  CEVAP =         2745
     . F6.3,8H  QLKG =F8.0,9H  ISRCH =I4//                                     2746
     . 46X,28H * * * S T O R A G E S * * *)                                    2747
      WRITE(6,4450)(APERD(I),APRD(I),I=1,NPER)                                 2748
 4450 FORMAT(11X,28A4)                                                         2749
      DO 4460 L=1,NL                                                           2750
      K = NL=L+1                                                               2751
C                                BRANCH TO  4460 FROM  4450.01                 2752
 4460 WRITE(6,4470) K,(STORL(I,M,K),I=1,NPER)                                  2753
 4470 FORMAT (6H LEVEL I4,1X,14F8.0)                                           2754
      WRITE(6,4480)(STOR(M,K),K=1,NTAB)                                        2755
 4480 FORMAT(/5H STOR 5X,12F9.0)                                               2756
      WRITE(6,4490)(AREA(M,K),K=1,NTAB)                                        2757
 4490 FORMAT (5H AREA 5X,12F9.1)                                               2758
      WRITE(6,4500)(QCAP(M,K),K=1,NTAB)                                        2759
 4500 FORMAT (5H QCAP 5X,12F9.0)                                               2760
      WRITE(6,4510)(EL(M,K),K=1,NTAB)                                          2761
 4510 FORMAT(5H ELEV 5X,12F9.2)                                                2762
      IF(MPWR.LE.0) GO TO 4660                                                 2763
C =I= POWER DATA                                                               2764
      IP=NPWR                                                                  2765
      WRITE(6,4520)                                                            2766
 4520 FORMAT(/12H POWER DATA#)                                                 2767
      WRITE(6,4530) OVLOD(IP),PWRMX(IP),TLWEL(IP),IDPR(IP),IPOW(IP),           2768
     . EFFCY(IP),MPSYS,PFMAX(IP)                                               2769
 4530 FORMAT(/48H    OVLOD    PWRMX    TLWEL     IDPR     IPOW    EFFCY       2770
     . 16H    MPSYS    PFMAX    /                                             2771
     . F8.2,F8.0,F8.1,2I8,F8.3,I8,F8.3)                                        2772
      WRITE(6,3000)                                                            2773
      IF(TLWEL(IP)) 4570,4540,4570                                             2774
 4540 WRITE(6,4550)(QT(IP,K),K=1,10)                                           2775
 4550 FORMAT(10H       FLOW 10F9.0)                                            2776
      WRITE(6,4560)(TL(IP,K),K=1,10)                                           2777
 4560 FORMAT(10H TAILWATER 10F9.0)                                             2778
C                                BRANCH TO  4570 FROM  4530.04                 2779
 4570 IF(IPOW(IP).LT.1) GO TO 4600                                             2780
      WRITE (6,4580)(PKPWR(IP,K),K=1,10)                                       2781
 4580 FORMAT (10H MAX POWER 10F9.0)                                            2782
      WRITE(6,4590)(CQOEL(IP,K),K=1,10)                                        2783
 4590 FORMAT(10H VS Q OR S 10F9.0)                                             2784
C                                BRANCH TO  4600 FROM  4570.00                 2785
 4600 IF(EFFCY(IP).GT.(=.1)) GO TO 4620                                        2786
      WRITE (6,4610) (EFCY(IP,K),K=1,10)                                       2787
 4610 FORMAT (9H EFCY 5X,10F9.3)                                               2788
C                                BRANCH TO  4620 FROM  4600.00                 2789
 4620 IF (IPWYR.GT.0)GO TO 4650                                                2790
      WRITE(6,4630)(POWR(I,IP),I=1,NPER)                                       2791
      DO 4640 I=1,NPER                                                         2792
      IF(POWR(I,IP).GT.(=.0001))GO TO 4640                                     2793
C                                BRANCH TO  4630 FROM  4620.01                 2794
 4630 FORMAT(5H POWR 6X,14F8.2)                                                2795
      ANDYS=NDAYS(I)                                                           2796
      POWR(I,IP)=POWR(I,IP)*PWRMX(IP)*(=.024)*ANDYS                            2797
C                                BRANCH TO  4640 FROM  4620.02  4620.03 2798
 4640 CONTINUE                                                                 2799
C                                BRANCH TO  4650 FROM  4620.00                 2800
 4650 IF(MPSYS.LE.0) GO TO 4660                                                2801
      NRESP(MPSYS)=NRESP(MPSYS)+1                                              2802
      ITP=NRESP(MPSYS)                                                         2803
      IRESP(MPSYS,ITP)=M                                                       2804
      ISYSR(M)=MPSYS                                                           2805
C                                BRANCH TO  4660 FROM  4420.01  4510.01 2806
```

```
C                                    4650.00                                    2807
 4660 IF(MDNST.GE.0) GO TO 3610                                                 2808
      DO 4690 MX=1,NCPT                                                         2809
      M=ICPT(MX)                                                                2810
      NTS=NTSRV(M)                                                              2811
      IF(NTS.LE.0)GO TO 4690                                                    2812
      DO 4680 K=1,NTS                                                           2813
      ITEMP=ITSRV(M,K)                                                          2814
      ITP=NRESR(ITEMP)                                                          2815
      DO 4670 IT=1,ITP                                                          2816
      IF(IRESM(ITEMP,IT).EQ.M)IRESM(ITEMP,IT)=-M                                2817
C                                BRANCH TO  4670 FROM  4660.08                  2818
 4670 CONTINUE                                                                  2819
C                                BRANCH TO  4680 FROM  4660.05                  2820
 4680 CONTINUE                                                                  2821
C                                BRANCH TO  4690 FROM  4660.01  4660.04         2822
 4690 CONTINUE                                                                  2823
      DO 4710 MX=1,NCPT                                                         2824
      M=ICPT(MX)                                                                2825
      IF(NRESR(M).LE.0) GO TO 4710                                              2826
      ITEMP = NRESR(M)                                                          2827
      DO 4700 K=1,ITEMP                                                         2828
      ITMP=IABS(IRESM(M,K))                                                     2829
      NSERV(ITMP)=NSERV(ITMP)+1                                                 2830
      ITP=NSERV(ITMP)                                                           2831
      IF (ITP.GT.KSERV) GO TO 4900                                              2832
      ISERV(ITMP,ITP)=ISIGN(M,IRESM(M,K))                                       2833
C                                BRANCH TO  4700 FROM  4690.04                  2834
 4700 CONTINUE                                                                  2835
C                                BRANCH TO  4710 FROM  4690.01                  2836
 4710 CONTINUE                                                                  2837
      REWIND 2                                                                  2838
C =J=                                                                           2839
      IE'.R=0                                                                   2840
      IPWYR=0                                                                   2841
      NQYR=0                                                                    2842
      KDT=0                                                                     2843
      NFLOW=0                                                                   2844
      NDVYR=0                                                                   2845
      NLYR=0                                                                    2846
      IT=0                                                                      2847
C                                BRANCH TO  4720 FROM  4740.05  4750.01         2848
C                                    4760.02  4770.02  4780.01  4790.01         2849
C                                    4810.02  4820.01  4830.01  4840.01         2850
C                                    4850.01  4860.01                          2851
 4720 READ(5,4730) ICD,ICRD                                                     2852
C                                BRANCH TO  4730 FROM  4740.02  4760.01         2853
 4730 FORMAT(A2,A4,A2,18A4)                                                     2854
      IDT=ICRD(2)                                                               2855
      IF(KDT.EQ.0)KDT=IDT                                                       2856
      DO 4740 I=1,13                                                            2857
      IF(ICD.EQ.KODE(I))GO TO 4760                                              2858
C                                BRANCH TO  4740 FROM  4730.03                  2859
 4740 CONTINUE                                                                  2860
      IF(IT.LE.0)GO TO 4750                                                     2861
      WRITE(2,4730)ICD,ICRD                                                     2862
      IT=IT+1                                                                   2863
      IF(IT.GE.3)GO TO 4870                                                     2864
      GO TO 4720                                                                2865
C                                BRANCH TO  4750 FROM  4740.01                  2866
 4750 PRINT 3650, ICD,ICRD                                                      2867
      GO TO 4720                                                                2868
C                                BRANCH TO  4760 FROM  4730.04                  2869
 4760 IF(I.EQ.13)GO TO 4870                                                     2870
      WRITE(2,4730)ICD,ICRD                                                     2871
C              IN   YF   EV   YD   UP   YS   YQ   UL   BN   BP                 2872
      GO TO (4770,4790,4800,4820,4830,4720,4840,4850,4720,4720,                 2873
C              BV   TI   ER                                                     2874
     *       4720,4860,4870),I                                                 2875
 4770 IF(IDT.EQ.KDT)GO TO 4780                                                  2876
      KDT=-99                                                                   2877
      GO TO 4720                                                                2878
```

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C                                   BRANCH TO  4780 FROM  4770.00          2879
 4780 NFLOW=NFLOW+1                                                        2880
      GO TO 4720                                                           2881
C                                   BRANCH TO  4790 FROM  4760.02          2882
 4790 IEVYR=1                                                              2883
      GO TO 4720                                                           2884
C                                   BRANCH TO  4800 FROM  4760.02          2885
 4800 IEVYR=-1                                                             2886
      DECODE(4,4810,ICRD(1))M                                              2887
 4810 FORMAT (I4)                                                          2888
      IEV(M)=1                                                             2889
      GO TO 4720                                                           2890
C                                   BRANCH TO  4820 FROM  4760.02          2891
 4820 IF(IDT.EQ.KDT)NDVYR=NDVYR+1                                          2892
      GO TO 4720                                                           2893
C                                   BRANCH TO  4830 FROM  4760.02          2894
 4830 IPWYR=1                                                              2895
      GO TO 4720                                                           2896
C                                   BRANCH TO  4840 FROM  4760.02          2897
 4840 IF(IDT.EQ.KDT)NQYR=NQYR+1                                            2898
      GO TO 4720                                                           2899
C                                   BRANCH TO  4850 FROM  4760.02          2900
 4850 IF(ICRD(2).NE.IBLK)NLYR=NLYR+1                                       2901
      GO TO 4720                                                           2902
C                                   BRANCH TO  4860 FROM  4760.02          2903
 4860 IT=IT+1                                                              2904
      IF(IT.LT.3)GO TO 4720                                                2905
C                                   BRANCH TO  4870 FROM  4740.04  4760.00 2906
C                                       4760.02                          2907
 4870 IF(NPER.LE.12)GO TO 4880                                             2908
      NFLOW=NFLOW/2                                                        2909
      NDVYR=NDVYR/2                                                        2910
      NQYR=NQYR/2                                                          2911
C                                   BRANCH TO  4880 FROM  4870.00          2912
 4880 ENDFILE 2                                                            2913
      REWIND 2                                                             2914
C             ZEROIZE NSTOR ARRAY                                        2915
      ITEMP=KCPT*KPER*10                                                   2916
      DO 4890 K=1,ITEMP                                                    2917
      NTSRV(K)=0                                                           2918
C                                   BRANCH TO  4890 FROM  4880.03          2919
 4890 CONTINUE                                                             2920
      RETURN                                                               2921
C                                   BRANCH TO  4900 FROM  3610.05  3740.03 2922
C                                       3810.01  3860.00  4040.02  4040.05 2923
C                                       4200.05  4690.08                   2924
 4900 WRITE(6,4910)                                                        2925
 4910 FORMAT(19H DIMENSION EXCEEDED)                                       2926
C                                   BRANCH TO  4920 FROM  3030.01          2927
 4920 STOP                                                                 2928
      END                                                                  2929
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      SUBROUTINE COMP (J)                                                    2930
      DIMENSION                                                              2931
     . EVTMP(30),IOPER(40),IPX(20),PGAU(20),PG(30,8,2),PGT(8),               2932
     . QOMNA(30),QOMNB(30),QOTMN(30),QOTMX(40),TWEL(20)                      2933
      COMMON/DTAPM/                                                          2934
     . KCPT,KPWR,KPWRS,KRES,KUPST,KDIV,KL,KPER,KQIL,KSERV,KUPQI              2935
      COMMON /ALPHA/                                                         2936
     . APERD(12),APRD(12),IDIV(40),IPWR(40),IYR1,NPWR,NRES,QM2(40),          2937
     . TITLE(60),IPWKW                                                       2938
      COMMON /BETA/                                                          2939
     . NYRS,IRG(10),CPT(40,8),ICPT(40),IRES(40),NCPT,NPER,QUNIT,VUNIT        2940
      COMMON/DLTA1/                                                          2941
     . CNTRL(12,40),QL(12,40),SYQI(40),QI(12,40),STORB(12,30),               2942
     . ELEV(12,30),SYEVP(30),EVP(12,30),SYPWR(22),POWER(12,22),              2943
     . SYSHP(22),SHRTP(12,22),SYPMX(22),POWRP(12,20),SYQA(40),QA(12,40)      2944
      COMMON/DLTA2/                                                          2945
     . ANDYS,AREA(30,10),CEVAP(30),CFLOD,CLOCL,CONST,CQOFL(20,10),           2946
     . EFCY(30,10),EFFCY(20),EFY(20),EL(30,10),EVAPO(12),HEAD(20),ICONS,     2947
     . ICSE(12,40),IDBAS(25),IDGST,IDPR(20),IDV(25),IDVPR,IDVSP,IEVYR,       2948
     . IPER(12),IPERA,IPOW(20),IPR(20),IPRN(40),IPWPR,IRESP(2,20),           2949
     . ISHDV(25),ISHQ(40),ISHR(30),ISPER,ISRCH(40),ISYSR(40),                2950
     . IUPST(40,18),METRC,NCYCL,NDAYS(12),NDIV,NDIVR(40),NDVSH(25),          2951
     . NFLW(40),NL,NLF,NPWRS,NRESM,NRESP(2),NSH2(40),NSHDV,NSHMN(40),        2952
     . NSHP(40),NSHPS(40),NSHQ,NSHR,NSPER,NSRTP(2),NUPST(40),OVLOD(20)       2953
      COMMON/DLTA3/                                                          2954
     . PFMAX(20),PKPWR(20,10),POWR(12,20),PWER(12,22),PWRMX(20),             2955
     . PWRS(12,2),          QCAP(30,10),QCONS(12,40),QDIV(12,25),           2956
     . QDIVA(12,25),QDIVR(40),QDIVS(12,25),QLKG(40),QMAXA(40),               2957
     . QMIN2(12,40),QMINA(12,40),QMINS(12,40),QMX(12,40),QO(30,8),           2958
     . QOMN(30),QOT(40,8),          QPREP(12,40),QT(20,10),RSHDV,RSHQ,       2959
     . RTIOD(25),SHDIV(12,25),SHDMX(25),SHMX(40),SHMX2(40),SHPMX(40),        2960
     . SHRT2(12,40),SHRTQ(12,40),SPSMX(40),STOR(30,10),STORA(30),            2961
     . STRAV(30),STRSH,SYCNS(40),SYDV(25),SYDVA(25),SYDYS,SYMSP(2),          2962
     . SYPR(22),SYPRE(40),SYQ(40),SYQL(40),SYQMN(40),SYSH2(40),              2963
     . SYSHD(25),SYSHQ(40),SYSP(22),SYSSP(12,20),SYSYS(22),TL(20,10),        2964
     . TLWEL(20),                                                            2965
     . IDIVF(40),NDIVF(40),IDCPT(40),IDSHT(40),DFUNC(20,40),DPARA(20,40)     2966
      COMMON /BALT/                                                          2967
     . IECON,IE(8,40),IYEAR,NRESR(40),NSTOR(12,40,10),QII(12,40),            2968
     . STORL(12,40,8),TMPP(40),TMPX(12)                                      2969
      COMMON /GAMMA/                                                         2970
     . IRESM(40,30),IDIVR(40,25), IEV(40)                                    2971
C =A=          START COMPUTATION FOR EACH PERIOD * * * * * * * * * * * * * 2972
      NFL=NL=NLF+1                                                           2973
      CKW=.08464                                                             2974
      IF(METRC.GT.0) CKW=9.817                                               2975
      DO 6470 I=1,NPER                                                       2976
      NC=0                                                                   2977
      ANDYS = NDAYS(I)                                                       2978
      CT = ANDYS/SYDYS                                                       2979
      CQS = CONST*ANDYS                                                      2980
      C8Q = 1./CQS                                                           2981
      CNST = .024*ANDYS                                                      2982
      IF (NPWR.LE.0) GO TO 5010                                              2983
      DO 5000 IP=1,NPWR                                                      2984
      IPX(IP)=0                                                              2985
C                                BRANCH TO  5000 FROM       .54            2986
 5000 PWER(I,IP)=POWR(I,IP)                                                  2987
C                                BRANCH TO  5010 FROM       .53            2988
 5010 EVPO= EVAPO(I)/12.                                                     2989
C =B= SHORTAGE DECLARATION                                                   2990
      IF (NSHR.LE.0.OR.ISPER.NE.IPER(I)) GO TO 5080                          2991
      TEMP=0.                                                                2992
      DO 5020 MX=1,NSHR                                                      2993
      M=ISHR(MX)                                                             2994
C                                BRANCH TO  5020 FROM  5010.04              2995
 5020 TEMP=TEMP+STORA(M)                                                     2996
      TMP=STRSH-TEMP                                                         2997
      DO 5070 K=1,NSPER                                                      2998
      IX=ISPER-IPERA + K                                                     2999
      IF (IX.LE.0) IX=IX+NPER                                                3000
      IF(IX.GT.NPER)IX=IX-NPER                                               3001
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      IF (NSHDV.LE.0) GO TO 5040                                          3002
      DO 5030 KX=1,NSHDV                                                  3003
      ID=ISHDV(KX)                                                        3004
      ID=IDIV(ID)                                                         3005
      IF (ID.LT.0) ID=(-ID)                                               3006
      QDIVS(IX,ID) = QDIV(IX,ID)                                          3007
      IF (QDIV(IX,ID).LE.0..OR.TMP.LE.0.) GO TO 5030                      3008
      QDIVS(IX,ID)=QDIV(IX,ID)*(1.-TMP*RSHDV)                             3009
      IF (QDIVS(IX,ID).LT.0.) QDIVS(IX,ID)=0.                             3010
C                                BRANCH TO  5030 FROM  5020.07  5020.12 3011
 5030 CONTINUE                                                            3012
C                                BRANCH TO  5040 FROM  5020.06          3013
 5040 IF (NSHQ.LE.0) GO TO 5070                                           3014
      DO 5050 KX=1,NSHQ                                                   3015
      M=ISHQ(KX)                                                          3016
      QMINS(IX,M)=QMINA(IX,M)                                             3017
      IF (TMP.GT.0.) QMINS(IX,M) = QMINA(IX,M)*(1.-TMP*RSHQ)              3018
C                                BRANCH TO  5050 FROM  5040.01          3019
 5050 CONTINUE                                                            3020
      DO 5060 KX=1,NSHQ                                                   3021
      M=ISHQ(KX)                                                          3022
      IF (QMINS(IX,M).LT.QMIN2(IX,M))QMINS(IX,M)=QMIN2(IX,M)              3023
C                                BRANCH TO  5060 FROM  5050.01          3024
 5060 CONTINUE                                                            3025
C                                BRANCH TO  5070 FROM  5020.02  5040.00 3026
 5070 CONTINUE                                                            3027
C -C- RE-ENTRY FOR SECOND APPROXIMATION  * * * * * * * * * * * * * * * * 3028
C                                BRANCH TO  5080 FROM  5010.02  6280.00 3029
 5080 NC=NC+1                                                             3030
      DO 5140 MX=1,NCPT                                                   3031
      M=ICPT(MX)                                                          3032
      IF(NC.LE.1) QMAXA(M)=999999.                                        3033
      IF(NC.LE.1)QOTMN(M)=0.                                              3033.1
      IF (IRES(M).LE.0) GO TO 5140                                        3034
C           RESERVOIR EVAPORATION AND OUTLET CAPACITY                     3035
      IF (NC.LE.1) STRAV(M)=STORA(M)                                      3036
      DO 5100 ITMP=2,10                                                   3037
      K = ITMP                                                            3038
      IF(STRAV(M).LE.STOR(M,K)) GO TO 5130                                3039
C                                                                         3040
      IF(STOR(M,K).GT.STOR(M,K-1)) GO TO 5100                             3041
C                                BRANCH TO  5090 FROM  5080.09          3042
 5090 K = K-1                                                             3043
      GO TO 5110                                                          3044
C                                BRANCH TO  5100 FROM  5080.06  5080.10 3045
 5100 CONTINUE                                                            3046
C                                BRANCH TO  5110 FROM  5090.01          3047
 5110 WRITE(6,5120) M                                                     3048
 5120 FORMAT (35H STORAGE TABLE EXTRAPOLATED FOR RES I4)                  3049
C                                BRANCH TO  5130 FROM  5080.08          3050
 5130 TEMP = 0.                                                           3051
      IF (STOR(M,K).GT.STOR(M,K-1))                                       3052
     .TEMP = (STRAV(M)-STOR(M,K-1))/(STOR(M,K)-STOR(M,K-1))               3053
      AREAV = TEMP*(AREA(M,K)-AREA(M,K-1))+AREA(M,K-1)                    3054
      TMP=EVPO                                                            3055
      IF(IEV(M).GE.1)  TMP=EVP(I,M)/12.                                   3056
      IF(METRC.GT.0) TMP=TMP*.012                                         3057
      EVTMP(M) = TMP*AREAV*CEVAP(M)                                       3058
      TMP=TEMP*(QCAP(M,K)-QCAP(M,K-1))+QCAP(M,K-1)                        3059
      IF(NC.LT.3)QMAXA(M)=TMP                                             3060
      IF(NC.GE.3)QMAXA(M)=(QMAXA(M)+TMP)*.5                               3061
      ELEV(I,M)=TEMP*(EL(M,K)-EL(M,K-1))+EL(M,K-1)                        3062
      IF(J.EQ.1.AND.I.EQ.1)ELEV(NPER,M)=ELEV(I,M)                         3063
      IF(IPWR(M).LE.0)GO TO 5140                                          3064
      IP=IPWR(M)                                                          3065
      IF(EFFCY(IP).GT.(-.1))GO TO 5140                                    3066
      EFY(IP)=TEMP*(FFCY(IP,K)-EFCY(IP,K-1))+EFCY(IP,K-1)                 3067
C                                BRANCH TO  5140 FROM  5080.01  5080.04 3068
C                                    5130.11  5130.13                    3069
 5140 CONTINUE                                                            3070
      DO 5940 MX = 1, NCPT                                                3071
      M=ICPT(MX)                                                          3072
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      NRESM=NRESR(M)                                                    3073
C *D* DESIRED FLOW AT CONTROL POINT                                     3074
      QA(I,M) = QMINS(I,M)                                              3075
      ICSE(I,M) = 1+100*M                                               3076
C                 TOTAL DIVERSION FROM LOCAL AREA                       3077
      TMPP(M) = QA(I,M)                                                 3078
      QDIVR(M)=0.                                                       3079
      IF (NDIVR(M).LE.0) GO TO 5230                                     3080
      ID=IDIV(M)                                                        3081
      IF(ID) 5150,5210,5160                                             3082
 5150 ID=(-ID)                                                          3083
      ITMP=IDBAS(ID)                                                    3084
      ITMP=IDIV(ITMP)                                                   3085
      QDIVS(I,ID)=QDIVA(I,ITMP)*RTIOD(ID)                               3086
      QDIV(I,ID)=QDIV(I,ITMP)*RTIOD(ID)                                 3087
      QDIVA(I,ID)=QDIVS(I,ID)                                           3088
      GO TO 5210                                                        3089
C                                 BRANCH TO  5160 FROM  5140.10         3090
 5160 TEMP=QDIV(I,ID)                                                   3091
      IF(NC.LE.1.OR.IDIVF(M).LE.0) GO TO 5200                           3092
      ITP=IDCRT(M)                                                      3093
      IF(IDIVF(M)-2) 5170,5180,5190                                     3094
 5170 CALL INTPOL(M,NDIVF(M),QPREP(I,ITP),DPARA,DFUNC,TEMP)             3095
      GO TO 5200                                                        3096
C                                 BRANCH TO  5180 FROM  5160.03         3097
 5180 CALL INTPOL(M,NDIVF(M),QI(I,ITP),DPARA,DFUNC,TEMP)                3098
      GO TO 5200                                                        3099
C                                 BRANCH TO  5190 FROM  5160.03         3100
 5190 CALL INTPOL(M,NDIVF(M),STRAV(ITP),DPARA,DFUNC,TEMP)               3101
C                                 BRANCH TO  5200 FROM  5160.01  5170.01 3102
C                                     5180.01                           3103
 5200 IF(TEMP.GT.QDIV(I,ID))TEMP=QDIV(I,ID)                             3104
      QDIVS(I,ID)=TEMP                                                  3105
      QDIVA(I,ID)=TEMP                                                  3106
C                                 BRANCH TO  5210 FROM  5140.10  5150.06 3107
 5210 ITMP = NDIVR(M)                                                   3108
      DO 5220 K=1, ITMP                                                 3109
      ITEMP=IDIVR(M,K)                                                  3110
      ID=IDIV(ITEMP)                                                    3111
      IF (ID.LT.0) ID=(-ID)                                             3112
      QDIVR(M)=QDIVR(M)+QDIVA(I,ID)                                     3113
C                                 BRANCH TO  5220 FROM  5210.01         3114
 5220 CONTINUE                                                          3115
C *E*          LIMIT FLOW TO RIVER BY CHANNEL CAPACITY                  3116
C                                 BRANCH TO  5230 FROM  5140.08         3117
 5230 TEMP=QMAXA(M)                                                     3118
      IF(QMX(I,M).LT.TEMP)TEMP=QMX(I,M)                                 3119
      QOTMX(M)=TEMP-QL(I,M)*(CFLOD-CLOCL)                               3120
      IF (QOTMX(M).LT.0.) QOTMX(M)=0.                                   3121
      IF(IRES(M).GT.0)QOTMX(M)=TEMP                                     3122
      ITMP=NUPST(M)                                                     3123
      IF(ITMP.LE.0) GO TO 5280                                          3124
      AL=1.                                                             3125
      TEMP=0.                                                           3126
      DO 5250 L=1,NL                                                    3127
      TMP=TEMP                                                          3128
      TEMP=QL(I,M)*CLOCL-QDIVR(M)                                       3129
      IF(IRES(M).GT.0)TEMP=QL(I,M)-QDIVR(M)+(STORA(M)*STORL(I,M,NL)-    3130
                          EVTMP(M))*CSQ                                 3131
      DO 5240 K=1,ITMP                                                  3132
      IR=IUPST(M,K)                                                     3133
      IF(IR.EQ.0)GO TO 5240                                             3134
      TMPA=QOT(IR,L)                                                    3135
      IF(TMPA.GT.QOTMX(IR))TMPA=QOTMX(IR)                               3136
      IF(L.LE.NFL.AND.TMPA.LT.QOTMN(IR))TMPA=QOTMN(IR)                  3137
      IF(ICONS.GT.0.AND.TMPA.LT.QOTMN(IR))TMPA=QOTMN(IR)                3138
      IF(TMPA.LT.QLKG(IR))TMPA=QLKG(IR)                                 3139
      QOT(IR,L)=TMPA                                                    3140
      TEMP=TEMP+TMPA                                                    3141
C                                 BRANCH TO  5240 FROM  5230.14  5230.16 3142
 5240 CONTINUE                                                          3143
      IF(L.EQ.1.OR.TEMP.GT.QOTMX(M)) GO TO 5250                         3144
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      IF(TEMP.GE.TMP) AL=(=1.)                                                  3145
      IF(TEMP.LT.TMP)AL=(QOTMX(M)=TMP)/(TEMP=TMP)                               3146
      GO TO 5260                                                                3147
C                                  BRANCH TO  5250 FROM  5230.09  5240.01 3148
 5250 CONTINUE                                                                  3149
      L=NL                                                                      3150
C                                  BRANCH TO  5260 FROM  5240.04          3151
 5260 IF(AL.LT.0.) GO TO 5280                                                   3152
      DO 5270 K=1,NRESM                                                         3153
      IR=IRESM(M,K)                                                             3154
      IF(IR.LT.0)IR=(=IR)                                                       3155
      IF(IR.EQ.M) GO TO 5270                                                    3156
      QOTMX(IR)=QOT(IR,L=1)*(1.=AL)+QOT(IR,L)*AL                                3157
C                                  BRANCH TO  5270 FROM  5260.01  5260.04 3158
 5270 CONTINUE                                                                  3159
C                                  BRANCH TO  5280 FROM  5230.06  5260.00 3160
 5280 IF(IRES(M).LE.0) GO TO 5410                                               3161
      ID=IDIV(M)                                                                3162
      TMP=0.                                                                    3163
      IF(ID.GT.0)TMP=QDIVA(I,ID)                                                3164
      QOTMN(M)=QLKG(M)=TMP                                                      3165
C *F*          POWER RELEASE                                                  3166
      TMPPR=0.                                                                  3167
      IF (IPWR(M).LE.0) GO TO 5390                                              3168
      IP = IPWR(M)                                                              3169
      TWEL(IP)=TLWEL(IP)                                                        3170
      ITEMP=0                                                                   3171
      IF (TLWEL(IP)) 5350,5300,5350                                             3172
C                                  BRANCH TO  5290 FROM  5370.08          3173
 5290 ITEMP=1                                                                   3174
C                                  BRANCH TO  5300 FROM  5280.10          3175
 5300 DO 5310 K=2,10                                                            3176
      IF(TMPP(M).LE.QT(IP,K)) GO TO 5330                                        3177
      IF(QT(IP,K).LE.0) GO TO 5320                                              3178
C                                  BRANCH TO  5310 FROM  5300.00          3179
 5310 CONTINUE                                                                  3180
      K=10                                                                      3181
      GO TO 5330                                                                3182
C                                  BRANCH TO  5320 FROM  5300.02          3183
 5320 K=K=1                                                                     3184
      IF(K.EQ.1) GO TO 5340                                                     3185
C                                  BRANCH TO  5330 FROM  5300.01  5310.02 3186
 5330 IF (QT(IP,K).LE.QT(IP,K=1)) GO TO 5340                                    3187
      TEMP=(TMPP(M)=QT(IP,K=1))/(QT(IP,K)=QT(IP,K=1))                           3188
      TWEL(IP)=TL(IP,K)*TEMP+TL(IP,K=1)*(1.=TEMP)                               3189
      GO TO 5350                                                                3190
C                                  BRANCH TO  5340 FROM  5320.01  5330.00 3191
 5340 TWEL(IP)=TL(IP,K)                                                         3192
C     TAILWATER AS LEVEL OF DOWNSTREAM RESERVOIR + 2 FEET                      3193
C                                  BRANCH TO  5350 FROM  5280.10  5330.03 3194
 5350 IF(IDPR(IP).LT.1) GO TO 5370                                              3195
      ITMP=IDPR(IP)                                                             3196
      TEMP=TLWEL(IP)                                                            3197
      IF(TEMP.LT.(.1))TEMP=TWEL(IP)                                             3198
      IX=I                                                                      3199
      IF (NC.GT.1) GO TO 5360                                                   3200
      IX=I=1                                                                    3201
      IF (IX.LE.0) IX=NPER                                                      3202
C                                  BRANCH TO  5360 FROM  5350.05          3203
 5360 TWEL(IP)=ELEV(IX,ITMP)+2.                                                 3204
      IF(METRC.GT.0)TWEL(IP)=TWEL(IP)=1.4                                       3205
      IF(TWEL(IP).LT.TEMP) TWEL(IP)=TEMP                                        3206
C                                  BRANCH TO  5370 FROM  5350.00          3207
 5370 HEAD(IP) = ELEV(I,M)=TWEL(IP)                                             3208
      CPWR = EFY(IP)*CKW*CNST                                                   3209
      TMPP(M)=PWER(I,IP)/(CPWR*HEAD(IP))+QLKG(M)                                3210
      IF(EFFCY(IP).LT.(=1.5))TMPP(M)=PWER(I,IP)/(EFY(IP)*CNST)+QLKG(M)          3211
      TMPPR=TMPP(M)                                                             3212
      IF (QA(I,M).GE.TMPP(M)) GO TO 5390                                        3213
      QA(I,M) = TMPP(M)                                                         3214
      IF(ITEMP.EQ.1) GO TO 5380                                                 3215
      IF(TLWEL(IP))5380,5290,5380                                               3216
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C                                   BRANCH TO  5380 FROM  5370.07          3217
 5380 ICSE(I,M)=2 * 100 * M                                                3218
C =G= RELEASE TO REACH EACH LEVEL,NEGLECTING UPSTREAM RELEASE              3219
C                                   BRANCH TO  5390 FROM  5280.06  5370.05 3220
 5390 DO 5400 L=1,NL                                                       3221
 5400 QO(M,L) = QL(I,M)-QDIVR(M)+(STORA(M)-STORL(I,M,L)-EVTMP(M))*C80      3222
      QOMN(M) = QO(M,NL)                                                   3223
      QOMNA(M)=QO(M,1)                                                     3224
      QOMNB(M)=QOMN(M)                                                     3225
C                                   BRANCH TO  5410 FROM  5280.00          3226
 5410 QCONS(I,M)=QA(I,M)                                                   3227
      IF(NRESR(M).GT.0)GO TO 5420                                          3228
C     LIMIT DIVERSION TO RUNOFF IN AREAS WITHOUT RESERVOIRS                3229
      QA(I,M)=QL(I,M)-QDIVR(M)                                             3230
      IF (QL(I,M).GE.QDIVR(M)) GO TO 5940                                  3231
      IF (ID.LT.0) ID=(-ID)                                                3232
      IF(ID.LE.0) GO TO 5940                                               3233
      TMP=QDIVA(I,ID)                                                      3234
      QDIVA(I,ID)=QL(I,M)-QDIVR(M)+TMP                                     3235
      QDIVR(M)=QDIVR(M)+QDIVA(I,ID)-TMP                                    3236
      QA(I,M)=0.                                                           3237
      GO TO 5940                                                           3238
C =H=          RESERVOIRS NOT OPERATING SPECIFICALLY,IOPER=-1              3239
C                                   BRANCH TO  5420 FROM  5410.01          3240
 5420 DO 5440 K=1,NRESM                                                    3241
      IRA=IRESM(M,K)                                                       3242
      IF (IRA.LE.(-1)) GO TO 5430                                          3243
      IOPER(IRA) = 1                                                       3244
      GO TO 5440                                                           3245
C                                   BRANCH TO  5430 FROM  5420.02          3246
 5430 IRA = -IRA                                                           3247
      IOPER(IRA) = -1                                                      3248
C                                   BRANCH TO  5440 FROM  5420.00  5420.04 3249
 5440 CONTINUE                                                             3250
C     TOTAL RELEASE FOR EACH LEVEL ABOVE EACH CONTROL POINT                3251
      LCNS=NPL                                                             3252
      IF(ICONS.GT.0)LCNS=NL-1                                              3253
      DO 5580 KA=1,NRESM                                                   3254
      IRA=IRESM(M,KA)                                                      3255
      IF(IRA.LT.0)IRA=-IRA                                                 3256
      ID=IDIV(IRA)                                                         3257
      NR=NUPST(IRA)                                                        3258
      DO 5570 LX=1,NL                                                      3259
      L=NL-LX+1                                                            3260
      QOT(IRA,L)=QO(IRA,L)                                                 3261
      IF(NPWRS.LE.0) GO TO 5470                                            3262
C               USE PG FOR QOT FOR LATER SYSTEM POWER ALLOCATION           3263
      DO 5460 IX=1,NPWRS                                                   3264
      PG(IRA,L,IX)=QO(IRA,L)                                               3265
      IF(IRA.EQ.M) GO TO 5450                                              3266
      PG(IRA,L,IX)=QOMN(IRA)                                               3267
      IF(ISYSR(IRA).NE.IX.AND.IOPER(IRA).LT.0) GO TO 5450                  3268
      PG(IRA,L,IX)=QO(IRA,L)                                               3269
      IF(PG(IRA,L,IX).LT.QOMN(IRA))PG(IRA,L,IX)=QOMN(IRA)                  3270
      IF(L.NE.1) GO TO 5450                                                3271
C               CHECK AVAILABILITY OF BUFFER STORAGE                       3272
      TMPG=QOMN(IRA)                                                       3273
      IF(TMPG.LT.PG(IRA,2,IX))TMPG=PG(IRA,2,IX)                            3274
      IF(IPWPR.LT.0)  PG(IRA,L,IX) = TMPG                                  3275
C                                   BRANCH TO  5450 FROM  5440.14  5440.16 3276
C                                      5440.19                             3277
 5450 IF(IPWR(IRA).LE.0.OR.NR.GT.0) GO TO 5460                             3278
      IP = IPWR(IRA)                                                       3279
      CPWR = EFY(IP) * CKW                                                 3280
C               LIMIT POWER TO MAX LOAD FACTOR                             3281
      TEMP=PWRMX(IP)*PFMAX(IP)/(CPWR*HEAD(IP))+QLKG(IRA)                   3282
      IF(EFFCY(IP).LT.(-1.5))TEMP=PWRMX(IP)*PFMAX(IP)/EFY(IP)+QLKG(IRA)    3283
      IF(PG(IRA,L,IX).GT.TEMP) PG(IRA,L,IX) = TEMP                         3284
C                                   BRANCH TO  5460 FROM  5440.12  5450.00 3285
 5460 CONTINUE                                                             3286
C                                   BRANCH TO  5470 FROM  5440.11          3287
 5470 IF(IOPER(IRA).LT.0)QOT(IRA,L)=QOMN(IRA)                              3288
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      IF(NR.LT.1) GO TO 5500                                                3289
      DO 5490 K=1,NR                                                        3290
      IR=IUPST(IRA,K)                                                       3291
      IF(NPWRS.LE.0) GO TO 5490                                             3292
      DO 5480 IX=1,NPWRS                                                    3293
      PG(IRA,L,IX)=PG(IRA,L,IX)+PG(IR,L,IX)                                 3294
      IF(IPWR(IRA).LE.0) GO TO 5480                                         3295
C               LIMIT POWER TO MAX LOAD FACTOR                              3296
      IP = IPWR(IRA)                                                        3297
      CPWR = EFFY(IP) * CKW                                                 3298
      TEMP=PWRMX(IP)*PFMAX(IP)/(CPWR*HEAD(IP))+QLKG(IRA)                    3299
      IF(EFFCY(IP).LT.(-1.5))TEMP=PWRMX(IP)*PFMAX(IP)/EFFY(IP)+QLKG(IRA)    3300
      IF(PG(IRA,L,IX).GT.TEMP) PG(IRA,L,IX) = TEMP                          3301
C                                 BRANCH TO  5480 FROM  5470.05  5470.07    3302
 5480 CONTINUE                                                              3303
C                                 BRANCH TO  5490 FROM  5470.02  5470.04    3304
 5490 QOT(IRA,L)=QOT(IRA,L)+QOT(IR,L)                                       3305
C *I=           FREEZE SYSTEM POWER RELEASES                                3306
C                                 BRANCH TO  5500 FROM  5470.01             3307
 5500 IP=IPWR(IRA)                                                          3308
      IF(ISYSR(IRA).LE.0.OR.IRA.EQ.M.OR.NC.EQ.1.OR.L.EQ.NL)GO TO 5520       3309
      IF(IPX(IP).LE.0.AND.L.LE.2)GO TO 5520                                 3310
      ITMP=NRESR(IRA)                                                       3311
      DO 5510 K=1,ITMP                                                      3312
      IR=IRESM(IRA,K)                                                       3313
      IF(IR.LT.0)IR=(-IR)                                                   3314
C                                 BRANCH TO  5510 FROM  5500.04             3315
 5510 QOT(IR,L)=QA(I,IR)                                                    3316
      GO TO 5560                                                            3317
C                                 BRANCH TO  5520 FROM  5500.01  5500.02    3318
 5520 IF(QOT(IRA,L).LT.QLKG(IRA).AND.IRA.NE.M)QOT(IRA,L)=QLKG(IRA)          3319
      IF(L.EQ.NL) GO TO 5530                                                3320
      IF(QOT(IRA,L).LT.QOTMN(IRA).AND.L.LE.NFL)QOT(IRA,L)=QOTMN(IRA)        3321
      IF(QOT(IRA,L).GT.QOTMX(IRA))QOT(IRA,L)=QOTMX(IRA)                     3322
      IF(QOT(IRA,L).LT.QOT(IRA,L+1))QOT(IRA,L)=QOT(IRA,L+1)                 3323
      GO TO 5560                                                            3324
C               CONSTRAIN MINIMUM RELEASE                                   3325
C                                 BRANCH TO  5530 FROM  5520.01             3326
 5530 TEMP=0.                                                               3327
      IF(ID.GT.0) TEMP=QDIVA(I,ID)                                          3328
      TEMP=QLKG(IRA)-TEMP                                                   3329
      IF(QOT(IRA,L).LT.TEMP)QOT(IRA,L)=TEMP                                 3330
      IF(ISRCH(IRA).GT.0.AND.QOT(IRA,L).GT.QMAXA(IRA))QOT(IRA,L)=           3331
     *     QMAXA(IRA)                                                       3332
      IF(ICONS.GT.0.AND.QOT(IRA,L).LT.QOTMN(IRA))QOT(IRA,L)=QOTMN(IRA)      3333
      IF(IDVSP.GT.0) GO TO 5540                                             3334
      IF(QOTMX(IRA).LT.QOT(IRA,NL))QOTMX(IRA)=QOT(IRA,NL)                   3335
      GO TO 5560                                                            3336
C               SPILL THRU DIVERSION                                        3337
C                                 BRANCH TO  5540 FROM  5530.07             3338
 5540 IF(QOT(IRA,L).LE.QOTMX(IRA)) GO TO 5560                               3339
      ID=IDIV(IRA)                                                          3340
      IF(ID.LE.0)GO TO 5560                                                 3341
      TEMP=QOT(IRA,L)-QOTMX(IRA)                                            3342
      QDIVA(I,ID)=QDIVA(I,ID)+TEMP                                          3343
      QDIVR(IRA)=QDIVR(IRA)+TEMP                                            3344
      DO 5550 LA=1,NL                                                       3345
 5550 QO(IRA,LA)=QO(IRA,LA)-TEMP                                            3346
      QOT(IRA,L)=QOTMX(IRA)                                                 3347
C                                 BRANCH TO  5560 FROM  5510.01  5520.05    3348
C                                    5530.09  5540.00  5540.02              3349
 5560 IF(IRA.NE.M.AND.QOT(IRA,L).LT.0.) QOT(IRA,L)=0.                       3350
C                                 BRANCH TO  5570 FROM  5440.08             3351
 5570 CONTINUE                                                              3352
C                                 BRANCH TO  5580 FROM  5440.03             3353
 5580 CONTINUE                                                              3354
      IF(IRES(M).GT.0) GO TO 5610                                           3355
C *J=           COMPUTE QOT, NON-RES                                        3356
      ITMP=NUPST(M)                                                         3357
      DO 5600 LX=1,NL                                                       3358
      L=NL-LX+1                                                             3359
      QOT(M,L)=QL(I,M)*CLOCL-QDIVR(M)                                       3360
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      DO 5590 K=1,ITMP                                                          3361
      IR=IUPST(M,K)                                                             3362
C                                     BRANCH TO  5590 FROM  5580.06             3363
 5590 QOT(M,L)=QOT(M,L)+QOT(IR,L)                                               3364
      IF(IDVSP.LE.0.OR.L.LT.NL) GO TO 5600                                      3365
      TMP=QMX(I,M)                                                              3366
      IF(TMP.GT.QMAXA(M))TMP=QMAXA(M)                                           3367
      IF(QOT(M,L).LE.TMP) GO TO 5600                                            3368
      ID=IDIV(M)                                                                3369
      IF(ID.LE.0)GO TO 5600                                                     3370
      TEMP=QOT(M,L)-TMP                                                         3371
      QDIVA(I,ID)=QDIVA(I,ID)+TEMP                                              3372
      QDIVR(M)=QDIVR(M)+TEMP                                                    3373
      QOT(M,L)=TMP                                                              3374
C                                     BRANCH TO  5600 FROM  5580.03  5590.01    3375
C                                         5590.04  5590.06                      3376
 5600 CONTINUE                                                                  3377
C           DIAGNOSTIC                                                         3378
C                                     BRANCH TO  5610 FROM  5580.01             3379
 5610 IF(IDGST.GT.0)WRITE(6,5620)                                               3380
     .    M,I,QA(I,M),(QOT(M,N),N=1,NL)                                        3381
C                                     BRANCH TO  5620 FROM  5610.00             3382
 5620 FORMAT (3H M=I3,5H   I=I3,6H   QA=F8.0,7H   QOT=10F8.0)                   3383
C              DIVERSION SHORTAGE                                              3384
      IF(IDIV(M).LE.0) GO TO 5650                                               3385
      TMP=QOT(M,1)-QLKG(M)                                                      3386
      IF(IDVPR.LE.-1)TMP=QOT(M,2)-QLKG(M)                                       3387
      IF(TMP.GE.0.) GO TO 5650                                                  3388
      TEMP=-TMP                                                                 3389
      ID=IDIV(M)                                                                3390
      IF(TEMP.GT.QDIVA(I,ID))TEMP=QDIVA(I,ID)                                   3391
      QDIVA(I,ID)=QDIVA(I,ID)-TEMP                                              3392
      IF(IRES(M).LE.0) GO TO 5630                                               3393
      QOMNA(M)=QOMNA(M)+TEMP                                                    3394
      QOMNB(M)=QOMNB(M)+TEMP                                                    3395
      IF(QOMN(M).LT.QOMNB(M))QOMN(M)=QOMNB(M)                                   3396
C                                     BRANCH TO  5630 FROM  5620.09             3397
 5630 DO 5640 L=1,NL                                                            3398
      QOT(M,L)=QOT(M,L)+TEMP                                                    3399
      IF(IRES(M).GT.0)QO(M,L)=QO(M,L)+TEMP                                      3400
C                                     BRANCH TO  5640 FROM  5630.00             3401
 5640 CONTINUE                                                                  3402
      IF(QOT(M,1).LT.0.)QOT(M,1)=0.                                             3403
      QDIVR(M)=QDIVR(M)-TEMP                                                    3404
      IF(QOTMX(M).GT.QOT(M,1))QOTMX(M)=QOT(M,1)                                 3405
C =K= LOCATE LEVEL FOR DESIRED RELEASE                                          3406
C                                     BRANCH TO  5650 FROM  5620.01  5620.04    3407
 5650 TEMP =QA(I,M)                                                             3408
      IFC=0                                                                     3409
      DO 5670 L =1,NL                                                           3410
      IF (TEMP .LT.QOT(M,L)) GO TO 5670                                         3411
      IF (L.GT.1) GO TO 5660                                                    3412
      AL = 1.                                                                   3413
      GO TO 5690                                                                3414
C                                     BRANCH TO  5660 FROM  5650.04             3415
 5660 TMP = L-1                                                                 3416
      AL = (TEMP -QOT(M,L-1))/(QOT(M,L)-QOT(M,L-1))+TMP                         3417
      GO TO 5680                                                                3418
C                                     BRANCH TO  5670 FROM  5650.02  5650.03    3419
 5670 CONTINUE                                                                  3420
      AL = NL                                                                   3421
C                                     BRANCH TO  5680 FROM  5660.02             3422
 5680 IF (AL.GE.2.) GO TO 5720                                                  3423
C     SHORTAGE IN BOTTOM BUFFER ZONE                                           3424
C                                     BRANCH TO  5690 FROM  5650.06             3425
 5690 TMP = QMIN2(I,M)                                                          3426
      IF(IPWPR.GT.(-1).AND.TMPPR.GT.TMP)TMP=TMPPR                               3427
      IF (QOT(M,2) .GE. QOT(M,1)) GO TO 5700                                    3428
      AL = (TMP-QOT(M,1))/(QOT(M,2)-QOT(M,1))+1.                                3429
      IF (AL-1.) 5700,5850,5710                                                 3430
C                                     BRANCH TO  5700 FROM  5690.02             3431
 5700 AL= 1.                                                                    3432
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      GO TO 5850                                                                3433
C                                  BRANCH TO  5710 FROM  5690.04                3434
 5710 IF (AL.GT.2.) AL=2.                                                       3435
      GO TO 5850                                                                3436
C                                  BRANCH TO  5720 FROM  5680.00                3437
 5720 ITP=NFL                                                                   3438
      TMP=ITP                                                                   3439
      IF (AL.LE.TMP) GO TO 5850                                                 3440
C =L= FLOOD RELEASES * * * * * * * * * * * * * * * * * * * * * * * * * * * *   3441
      IFC=1                                                                     3442
      GO TO 5850                                                                3443
C                                  BRANCH TO  5730 FROM  5910.01                3444
 5730 TEMP=0.                                                                   3445
      ITP=NFL                                                                   3446
      IF (IRES(M).LE.0) TEMP=CFLOD*CLOCL                                        3447
      TMP=QMX(I,M)                                                              3448
      IF(TMP.GT.QMAXA(M))TMP=QMAXA(M)                                           3449
      TEMP=TMP*QL(I,M)*TEMP                                                     3450
      TMP = 0.                                                                  3451
      L=NL                                                                      3452
      IF(QOT(M,NL).GT.TEMP) GO TO 5770                                          3453
C            MINOR FLOOD CONTROL RELEASES, TMP=0.                               3454
      L=ITP+1                                                                   3455
      IF (QOT(M,ITP).LT.TEMP.OR.QOT(M,NL).GE.QOT(M,ITP)) GO TO 5760             3456
C           FULL FLOOD CONTROL RELEASES                                         3457
      ITP=ITP+1                                                                 3458
      DO 5740 L=ITP,NL                                                          3459
      IF(TEMP.GE.QOT(M,L)) GO TO 5750                                           3460
C                                  BRANCH TO  5740 FROM  5730.12                3461
 5740 CONTINUE                                                                  3462
      L=NL                                                                      3463
C                                  BRANCH TO  5750 FROM  5730.13                3464
 5750 TMP=0.                                                                    3465
      TMPG=QOT(M,L)-QOT(M,L-1)                                                  3466
      IF(TMPG.LT.0.) TMP=(TEMP-QOT(M,L-1))/TMPG                                 3467
C     FLOOD CONTROL RELEASES = BALANCE WITH UPSTREAM RESERVOIRS                  3468
C                                  BRANCH TO  5760 FROM  5730.10                3469
 5760 IF (TMP.LT.0.) TMP=0.                                                     3470
      IF (TMP.LE.1.) GO TO 5780                                                 3471
C                                  BRANCH TO  5770 FROM  5730.08                3472
 5770 TMP = 1.                                                                  3473
C                                  BRANCH TO  5780 FROM  5760.01                3474
 5780 AL=L-1                                                                    3475
      AL = AL+TMP                                                               3476
      DO 5840 K=1, NRESM                                                        3477
      IR=IRESM(M,K)                                                             3478
      IF (IR.LE.0) IR=(-IR)                                                     3479
      TEMP=QOT(IR,L-1)*(1.-TMP)+QOT(IR,L)*TMP                                   3480
      TMPA=TEMP                                                                 3481
      ITMP=NUPST(IR)                                                            3482
      IF(ITMP.LE.0) GO TO 5800                                                  3483
      DO 5790 ITP=1,ITMP                                                        3484
      IRA=IUPST(IR,ITP)                                                         3485
C                                  BRANCH TO  5790 FROM  5780.09                3486
 5790 TMPA=TMPA-QA(I,IRA)                                                       3487
C                                  BRANCH TO  5800 FROM  5780.08                3488
 5800 IF(IR.EQ.M) GO TO 5810                                                    3489
      IF (QA(I,IR).GE.TEMP+.1) GO TO 5810                                       3490
      IF (QA(I,IR).GE.TEMP-.1) GO TO 5820                                       3491
C                                  BRANCH TO  5810 FROM  5800.00  5800.01       3492
 5810 ICSE(I,IR) =3+100*M                                                       3493
      QA(I,IR) = TEMP                                                           3494
C                                  BRANCH TO  5820 FROM  5800.02                3495
 5820 IF(QCONS(I,IR).GT.TEMP)QCONS(I,IR)=TEMP                                   3496
      QOMN(IR)=TMPA                                                             3497
      IF(QOMN(IR).GT.QOMNA(IR))QOMN(IR)=QOMNA(IR)                               3498
      IF(QOMN(IR).LT.QOMNB(IR))QOMN(IR)=QOMNB(IR)                               3499
      IF(QOTMN(IR).GT.TEMP)QOTMN(IR)=TEMP                                       3500
C          DIAGNOSTIC                                                         3501
      IF(IDGST.GT.0)WRITE(6,5830)                                               3502
     .   IR,I,QA(I,IR),AL,(QOT(IR,N),N=1,NL),QOTMN(IR),QOTMX(IR)                3503
C                                  BRANCH TO  5830 FROM  5820.05  5900.00       3504
```

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 5830 FORMAT (4H IR=I3,5H   I=I3,6H   QA=F8.0,6H   AL=F6.3,                3505
     .  7H   QOT= 10F8.0)                                                  3506
C                                  BRANCH TO  5840 FROM  5780.02          3507
 5840 CONTINUE                                                            3508
      GO TO 5920                                                          3509
C ***      CONSERVATION RELEASES - BALANCE WITH UPSTREAM RESERVOIRS * *    3510
C                                  BRANCH TO  5850 FROM  5690.04  5700.01 3511
C                                      5710.01  5720.02  5720.04          3512
 5850 DO 5910 K=1,NRESM                                                   3513
      IR = IRESM(M,K)                                                     3514
      IF(IR.LE.0) IR=(-IR)                                                3515
      L = AL                                                              3516
      TMP=L                                                               3517
      TMP = AL-TMP                                                        3518
      TEMP=QOT(IR,L)                                                      3519
      IF(L.LT.NL)TEMP=QOT(IR,L)*(1.-TMP)+QOT(IR,L+1)*TMP                  3520
      IF(TEMP.LT.QOTMN(IR)) GO TO 5880                                    3521
      QASUM=0.                                                            3522
      IF(NUPST(IR).LE.0) GO TO 5870                                       3523
      ITMP=NUPST(IR)                                                      3524
      DO 5860 ITP=1,ITMP                                                  3525
      IRA=IUPST(IR,ITP)                                                   3526
C                                  BRANCH TO  5860 FROM  5850.12          3527
 5860 QASUM=QASUM+QA(I,IRA)                                               3528
C                                  BRANCH TO  5870 FROM  5850.10          3529
 5870 QOMN(IR)=TEMP-QASUM                                                 3530
      QOTMN(IR)=TEMP                                                      3531
C                                  BRANCH TO  5880 FROM  5850.08          3532
 5880 IF(IFC.GT.0) GO TO 5910                                             3533
      IF(IR.EQ.M) GO TO 5890                                              3534
      IF (QA(I,IR).GE.TEMP+.1) GO TO 5890                                 3535
      IF (QA(I,IR).GE.TEMP-.1) GO TO 5900                                 3536
C                                  BRANCH TO  5890 FROM  5880.01  5880.02 3537
 5890 ICSE(I,IR) = ICSE(I,M)                                              3538
      QA(I,IR) = TEMP                                                     3539
      QCONS(I,IR)=TEMP                                                    3540
C          DIAGNOSTIC                                                     3541
C                                  BRANCH TO  5900 FROM  5880.03          3542
 5900 IF(IDGST.GT.0)WRITE(6,5830)                                         3543
     .  IR,I,QA(I,IR),AL,(QOT(IR,N),N=1,NL),QOTMN(IR),QOTMX(IR)          3544
C                                  BRANCH TO  5910 FROM  5850.00  5880.00 3545
 5910 CONTINUE                                                            3546
      IF(IFC.GT.0) GO TO 5730                                             3547
C                                  BRANCH TO  5920 FROM  5840.01          3548
 5920 IF(NUPST(M).LE.0.OR.IRES(M).GT.0) GO TO 5940                        3549
      QASUM=0.                                                            3550
      ITMP=NUPST(M)                                                       3551
      DO 5930 ITP=1,ITMP                                                  3552
      IRA=IUPST(M,ITP)                                                    3553
      QASUM=QASUM+QA(I,IRA)                                               3554
C                                  BRANCH TO  5930 FROM  5920.03          3555
 5930 CONTINUE                                                            3556
      QA(I,M)=QL(I,M)-QDIVR(M)+QASUM                                      3557
      IF(QA(I,M).GE.0..OR.IDIV(M).LE.0) GO TO 5940                        3558
C             DIVERSION SHORTAGE                                          3559
      ID=IDIV(M)                                                          3560
      QDIVA(I,ID)=QDIVA(I,ID)+QA(I,M)                                     3561
      QDIVR(M)=QDIVR(M)+QA(I,M)                                           3562
      QA(I,M)=0.                                                          3563
      QCONS(I,M)=0.                                                       3564
C             DO LOOP STARTS AT 5140+1                                    3565
C                                  BRANCH TO  5940 FROM  5140.01  5410.03 3566
C                                      5410.05  5410.10  5920.00  5930.02 3567
 5940 CONTINUE                                                            3568
C ***      COMPUTE FLOWS AND STORAGES * * * * * * * * * * * * * * * * *  3569
      DO 6100 MX=1,NCPT                                                   3570
      M= ICPT(MX)                                                         3571
      QPREP(I,M)=QL(I,M)                                                  3572
      QI(I,M) = QL(I,M)-QDIVR(M)                                          3573
      TEMP = 0.                                                           3574
      ID=IDIV(M)                                                          3575
      IF (ID) 5950,5970,5960                                              3576
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 5950 ID=(-ID)                                                          3577
C                                    BRANCH TO  5960 FROM  5940,07      3578
 5960 QI(I,M)=QI(I,M)+QDIVA(I,ID)                                       3579
      TEMP = QDIVA(I,ID)                                                3580
C                                    BRANCH TO  5970 FROM  5940,07      3581
 5970 IF (NUPST(M),LE,0) GO TO 5990                                     3582
      NR= NUPST(M)                                                      3583
      DO 5980 K=1,NR                                                    3584
      IR = IUPST(M,K)                                                   3585
      QPREP(I,M) = QPREP(I,M)+QPREP(I,IR)                               3586
C                                    BRANCH TO  5980 FROM  5970,02      3587
 5980 QI(I,M) = QI(I,M)+QA(I,IR)                                        3588
      IF(IRES(M),LE,0) QA(I,M)=QI(I,M)*TEMP                             3589
C                                    BRANCH TO  5990 FROM  5970,00      3590
 5990 IF (IRES(M),LE,0) GO TO 6100                                      3591
      STORB(I,M) = STORA(M)+EVTMP(M)+(QI(I,M)-QA(I,M)*TEMP)*CQS         3592
C       ELIMINATE POSSIBLE NEGATIVE STORAGES                            3593
      IF (STORB(I,M),GT,(-,1)) GO TO 6000                               3594
      EVTMP(M)=EVTMP(M)+STORB(I,M)                                      3595
      STORB(I,M) = 0.                                                   3596
C                                    BRANCH TO  6000 FROM  5990,02      3597
 6000 STRAV(M) = (STORA(M)+STORB(I,M))*,5                               3598
      DO 6010 ITMP=2,10                                                 3599
      K=ITMP                                                            3599.1
      IF (STORB(I,M),LE,STOR(M,K)) GO TO 6020                           3600
      IF(STOR(M,K),GT,STOR(M,K-1)) GO TO 6010                           3600.1
      K=K-1                                                             3600.2
      GO TO 6020                                                        3600.3
C                                    BRANCH TO  6010 FROM  6000,01      3601
 6010 CONTINUE                                                          3602
      K = 10                                                            3603
C                                    BRANCH TO  6020 FROM  6000,02      3604
 6020 TEMP = 0.                                                         3605
      IF(STOR(M,K),GT,STOR(M,K-1))                                      3606
     *TEMP = (STORB(I,M)-STOR(M,K-1))/(STOR(M,K)-STOR(M,K-1))           3607
      ELEV(I,M) = EL(M,K-1)*(1.-TEMP)+EL(M,K)*TEMP                      3608
      IF (IPWR(M),LE,0) GO TO 6100                                      3609
      IP=IPWR(M)                                                        3610
      POWRP(I,IP)=PWRMX(IP)*OVLOD(IP)                                   3611
      IF(IPOW(IP)-1)6100,6030,6060                                      3612
 6030 DO 6040 K=2,10                                                    3613
      IF (STRAV(M),LE,CQOEL(IP,K)) GO TO 6050                           3614
C                                    BRANCH TO  6040 FROM  6030,00      3615
 6040 CONTINUE                                                          3616
      K=10                                                              3617
C                                    BRANCH TO  6050 FROM  6030,01      3618
 6050 TEMP=0.                                                           3619
      IF (CQOEL(IP,K),GT,CQOEL(IP,K-1))                                 3620
     * TEMP=(STRAV(M)-CQOEL(IP,K-1))/(CQOEL(IP,K)-CQOEL(IP,K-1))        3621
      GO TO 6090                                                        3622
C                                    BRANCH TO  6060 F OM  6020,07      3623
 6060 DO 6070 K=2,10                                                    3624
       IF (QA(I,M),LE,CQOEL(IP,K)) GO TO 6080                           3625
C                                    BRANCH TO  6070 FROM  6060,00      3626
 6070 CONTINUE                                                          3627
      K=10                                                              3628
C                                    BRANCH TO  6080 FROM  6060,01      3629
 6080 TEMP=0.                                                           3630
      IF (CQOEL(IP,K),GT,CQOEL(IP,K-1))                                 3631
     * TEMP=(QA(I,M)-CQOEL(IP,K-1))/(CQOEL(IP,K)-CQOEL(IP,K-1))        3632
C                                    BRANCH TO  6090 FROM  6050,03      3633
 6090 POWRP(I,IP)=PKPWR(IP,K-1)*(1.-TEMP)+PKPWR(IP,K)*TEMP              3634
C                                    BRANCH TO  6100 FROM  5940,01  5990,00 3635
C                                        6020,04  6020,07              3636
 6100 CONTINUE                                                          3637
C =O=          ALLOCATE CONSERVATION RELEASES TO UPSTREAM RESERVOIRS    3638
      DO 6130 MX=1,NCPT                                                 3639
      ITMP = NCPT-MX+1                                                  3640
      M=ICPT(ITMP)                                                      3641
      IF(QCONS(I,M),GT,QA(I,M)) QCONS(I,M)=QA(I,M)                      3642
      IF (NUPST(M),LE,0) GO TO 6130                                     3643
      NR=NUPST(M)                                                       3644
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      TEMP=1.                                                                3645
      IF (IRES(M).LE.0) TEMP=CLOCL                                           3646
      QAX=0.                                                                 3647
      QCX=0.                                                                 3648
      DO 6110 K=1,NR                                                         3649
      IR=IUPST(M,K)                                                          3650
      QAX=QAX+QA(I,IR)                                                       3651
C                                  BRANCH TO  6110 FROM  6100.11              3652
 6110 QCX=QCX+QCONS(I,IR)                                                    3653
      IF (QAX.LE.QCX) GO TO 6130                                             3654
      TMP=(QCONS(I,M)+QDIVR(M)*QL(I,M)*TEMP-QCX)/(QAX-QCX)                   3655
      IF (TMP.LE.0.) GO TO 6130                                              3656
      IF (TMP.GT.1.) TMP=1.                                                  3657
      DO 6120 K=1,NR                                                         3658
      IR=IUPST(M,K)                                                          3659
C                                  BRANCH TO  6120 FROM  6110.05              3660
 6120 QCONS(I,IR)=QCONS(I,IR)+(QA(I,IR)-QCONS(I,IR))*TMP                     3661
C                                  BRANCH TO  6130 FROM  6100.01  6100.05 3662
C                                      6110.01  6110.03                      3663
 6130 CONTINUE                                                               3664
      IF (NPWR.LE.0) GO TO 6150                                              3665
C               COMPUTE POWER                                                3666
      DO 6140 IP=1,NPWR                                                      3667
      M = IPR(IP)                                                            3668
      CPWR=EFY(IP)*CKW                                                       3669
      TEMP=QLKG(M)+.000000001                                                3670
      IF (QA(I,M).LT.TEMP) QA(I,M)=TEMP                                      3671
      POWER(I,IP)=CPWR*HEAD(IP)* QA(I,M)-QLKG(M))                            3672
C               USE KW/CFS TABLE                                             3673
      IF(EFFCY(IP).LT.(-1.5))POWER(I,IP)=(QA(I,M)-QLKG(M))*EFY(IP)           3674
      TMPP(IP)=POWER(I,IP)-.1                                                3675
      IF(IPOW(IP).LE.0) GO TO 6140                                           3676
      IF(POWER(I,IP).GT.POWRP(I,IP)) POWER(I,IP)=POWRP(I,IP)                 3677
C                                  BRANCH TO  6140 FROM  6130.02  6130.10 3678
 6140 POWER(I,IP)=POWER(I,IP)*CNST                                           3679
C                                  BRANCH TO  6150 FROM  6130.01              3680
 6150 IF(NPWRS.LE.0.OR.NC.GE.NCYCL) GO TO 6280                               3681
C =P=           DISTRIBUTE SYSTEM POWER * * * * * *                          3682
      DO 6270 IX=1,NPWRS                                                     3683
      ITEMP=NRESP(IX)                                                        3684
      TMPRS=PWRS(I,IX)                                                       3685
      DO 6160 L = 1,NL                                                       3686
 6160 PGT(L)=0.                                                              3687
      PGAUT=0.                                                               3688
      PWERT=0.                                                               3689
      POWRT=0.                                                               3690
      DO 6190 K=1,ITEMP                                                      3691
      M=IRESP(IX,K)                                                          3692
      IP=IPWR(M)                                                             3693
      PGAU(K)=POWER(I,IP)                                                    3694
      TMP=POWRP(I,IP)*CNST                                                   3695
      TEMP=PWRMX(IP)*PFMAX(IP)*CNST                                          3696
      IF(TMP.GT.TEMP)TMP=TEMP                                                3697
      IF(PGAU(K).GT.TMP)PGAU(K)=TMP                                          3698
      IF(NC.EQ.1) PWER(I,IP)=PGAU(K)                                         3699
      IF(PWER(I,IP).LT.POWR(I,IP))PWER(I,IP)=POWR(I,IP)                      3700
C               SEARCH FOR LEVEL TO DEVELOP SYSTEM POWER                     3701
      DO 6180 L=1,NL                                                         3702
      TEMP=POWER(I,IP)*(PG(M,L,IX)-QLKG(M))/(QA(I,M)-QLKG(M))                3703
      IF(TEMP.GT.TMP)TEMP=TMP                                                3704
      ITP=2                                                                  3705
      IF(IPWPR.GT.0) ITP=1                                                   3706
      IF(L.LE.ITP) GO TO 6170                                                3707
      TMPA=PG(M,ITP,IX)                                                      3708
      IF(TMPA.GT.POWR(I,IP)) TMPA=POWR(I,IP)                                 3709
      IF(TEMP.LT.TMPA) TEMP=TMPA                                             3710
C                                  BRANCH TO  6170 FROM  6160.19              3711
 6170 PG(M,L,IX)=TEMP                                                        3712
      PGT(L)=PGT(L)+TEMP                                                     3713
C                                  BRANCH TO  6180 FROM  6160.14              3714
 6180 CONTINUE                                                               3715
      PWERT=PWERT+PWER(I,IP)                                                 3716
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      POWRT=POWRT+POWR(I,IP)                                                    3717
C                                  BRANCH TO  6190 FROM  6160.04              3718
 6190 PGAUT=PGAUT+PGAU(K)                                                       3719
      TEMP=0.                                                                   3720
      DO 6200 L=2,NL                                                            3721
      IF(TMPRS.LT.PGT(L)) GO TO 6200                                            3722
      IF(PGT(L).LT.PGT(L-1)) TEMP=(TMPRS-PGT(L))/(PGT(L-1)-PGT(L))              3723
      IF(TEMP.GT.1.)TEMP=1.                                                     3724
      GO TO 6210                                                                3725
C                                  BRANCH TO  6200 FROM  6190.02  6190.03     3726
 6200 CONTINUE                                                                  3727
      L=NL                                                                      3728
C =Q=          ASSIGN SYSTEM POWER                                            3729
C                                  BRANCH TO  6210 FROM  6190.06              3730
 6210 PWERT=0.                                                                  3731
      DO 6220 K=1,ITEMP                                                         3732
      M=IRESP(IX,K)                                                             3733
      IP=IPWR(M)                                                                3734
      PWER(I,IP)=PG(M,L,IX)*(1.-TEMP)+PG(M,L-1,IX)*TEMP                         3735
      PWERT=PWERT+PWER(I,IP)                                                    3736
      IPX(IP)=1                                                                 3737
      IF(PWER(I,IP).LT.TMPP(IP))IPX(IX)=0                                       3738
C                                  BRANCH TO  6220 FROM  6210.01              3739
 6220 CONTINUE                                                                  3740
      IF(PWERT.GT.(TMPRS-.01).AND.PWERT.LT.(TMPRS+.01)) GO TO 6270              3741
      TMPA=0.                                                                   3742
      TMP=0.                                                                    3743
      TEMP=0.                                                                   3744
      DO 6230 K=1,ITEMP                                                         3745
      M=IRESP(IX,K)                                                             3746
      IP=IPWR(M)                                                                3747
      TMPA=TMPA+PWRMX(IP)*PFMAX(IP)*CNST                                        3748
      TMP=TMP+POWR(I,IP)                                                        3749
C                                  BRANCH TO  6230 FROM  6220.05              3750
 6230 TEMP=TEMP+PWER(I,IP)                                                      3751
      IF(TEMP.GE.PWRS(I,IX)) GO TO 6250                                         3752
      TMP=(PWRS(I,IX)-TEMP)/(TMPA-TEMP)                                         3753
      IF(TMP.GT.1.)TMP=1.                                                       3754
      DO 6240 K=1,ITEMP                                                         3755
      M=IRESP(IX,K)                                                             3756
      IP=IPWR(M)                                                                3757
      PWER(I,IP)=PWRMX(IP)*PFMAX(IP)*CNST*TMP+PWER(I,IP)*(1.-TMP)               3758
      IPX(IP)=1                                                                 3759
      IF(PWER(I,IP).LT.TMPP(IP))IPX(IX)=0                                       3760
C                                  BRANCH TO  6240 FROM  6230.04              3761
 6240 CONTINUE                                                                  3762
      GO TO 6270                                                                3763
C                                  BRANCH TO  6250 FROM  6230.01              3764
 6250 TMP=(PWRS(I,IX)-TMP)/(TEMP-TMP)                                           3765
      IF(TMP.LT.0.)TMP=0.                                                       3766
      DO 6260 K=1,ITEMP                                                         3767
      M=IRESP(IX,K)                                                             3768
      IP=IPWR(M)                                                                3769
      PWER(I,IP)=PWER(I,IP)*TMP+POWR(I,IP)*(1.-TMP)                             3770
      IPX(IP)=1                                                                 3771
      IF(PWER(I,IP).LT.TMPP(IP))IPX(IX)=0                                       3772
C                                  BRANCH TO  6260 FROM  6250.02              3773
 6260 CONTINUE                                                                  3774
C                                  BRANCH TO  6270 FROM  6150.01  6220.01     3775
C                                      6240.01                                3776
 6270 CONTINUE                                                                  3777
C          BRANCH BACK FOR SECOND APPROXIMATION  *  *  *  *  *  *  *  *       3778
C                                  BRANCH TO  6280 FROM  6150.00              3779
 6280 IF (NC.LT.NCYCL) GO TO 5080                                               3780
C =R= COMPUTE POWER, SHORTAGES AND ANNUAL SUMS                                 3781
      IF (NPWR.LE.0) GO TO 6340                                                 3782
      CTX=1.                                                                    3783
      IF(IPWKW.GT.0) CTX=CT                                                     3784
      IF(NPWRS.LE.0) GO TO 6300                                                 3785
      DO 6290 IX=1,NPWRS                                                        3786
 6290 TMPP(IX)=0.                                                               3787
C                                  BRANCH TO  6300 FROM  6280.04              3788
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 6300 DO 6310 IP=1 NPWR                                                    3789
      M=IPR(IP)                                                            3790
      TEMP=PWRMX(IP)*OVLOD(IP)*CNST                                        3791
      IF(POWER(I,IP).GT.TEMP)POWER(I,IP)=TEMP                              3792
      SYPWR(IP) = SYPWR(IP)+POWER(I,IP)*CTX                                3793
      SYPR(IP) = SYPR(IP)+POWR(I,IP)*CTX                                   3794
      SYSP(IP)=SYSP(IP)+PWER(I,IP)*CTX                                     3795
      SHRTP(I,IP) = POWR(I,IP)-POWER(I,IP)                                 3796
      SYSSP(I,IP)=PWER(I,IP)-POWER(I,IP)                                   3797
      IF(SYSSP(I,IP).LT.0.)SYSSP(I,IP)=0.                                  3798
      IF(SYSSP(I,IP).GT..01)NSHPS(M)=NSHPS(M)+1                            3799
      IF(SYSSP(I,IP).GT.SPSMX(M))SPSMX(M)=SYSSP(I,IP)                      3800
      IF(SHRTP(I,IP).GT.1.)NSHP(M)=NSHP(M)+1                               3801
      IF(SHRTP(I,IP).GT.SHPMX(M)) SHPMX(M)=SHRTP(I,IP)                     3802
      IF (SHRTP(I,IP).LT.0.) SHRTP(I,IP)=0.                                3803
      IX=ISYSR(M)                                                          3804
      IF(IX.LE.0)GO TO 6310                                                3805
      TMPP(IX)=TMPP(IX)+SHRTP(I,IP)                                        3806
      SYSYS(IP)=SYSYS(IP)+SYSSP(I,IP)*CTX                                  3807
C                                  BRANCH TO  6310 FROM  6300.00  6300.16 3808
 6310 SYSHP(IP) = SYSHP(IP)+SHRTP(I,IP)*CTX                                3809
      IF (NPWRS.LE.0) GO TO 6340                                           3810
      DO 6330 IX=1,NPWRS                                                   3811
      MX=KPWR+IX                                                           3812
      POWER(I,MX)=0.                                                       3813
      PWER(I,MX)=0.                                                        3814
      ITEMP=NRESP(IX)                                                      3815
      DO 6320 K=1,ITEMP                                                    3816
      M=IRESP(IX,K)                                                        3817
      IP=IPWR(M)                                                           3818
      TEMP=POWER(I,IP)                                                     3819
      POWER(I,MX)=POWER(I,MX)+TEMP                                         3820
      ATMP=PWRMX(IP)*PFMAX(IP)*CNST                                        3821
      IF(TEMP.GT.ATMP) TEMP=ATMP                                           3822
      PWER(I,MX)=PWER(I,MX)+TEMP                                           3823
C                                  BRANCH TO  6320 FROM  6310.07          3824
 6320 CONTINUE                                                             3825
      SYPWR(MX)=SYPWR(MX)+POWER(I,MX)*CTX                                  3826
      SYPR(MX)=SYPR(MX)+PWRS(I,IX)*CTX                                     3827
      SHRTP(I,MX)=PWRS(I,IX)-PWER(I,MX)                                    3828
      IF(SHRTP(I,MX).LT.TMPP(IX))SHRTP(I,MX)=TMPP(IX)                      3829
      SYSP(MX)=SYSP(MX)+PWER(I,MX)*CTX                                     3830
      IF(SHRTP(I,MX).LT.0.) SHRTP(I,MX)=0.                                 3831
      IF(SHRTP(I,MX).GT.1.)NSRTP(IX)=NSRTP(IX)+1                           3832
      IF(SHRTP(I,MX).GT.SYMSP(IX))SYMSP(IX)=SHRTP(I,MX)                    3833
      SYSHP(MX)=SYSHP(MX)+SHRTP(I,MX)*CTX                                  3834
C                                  BRANCH TO  6330 FROM  6310.02          3835
 6330 CONTINUE                                                             3836
C =S=          FLOW AND STORAGE SUMMARY                                    3837
C                                  BRANCH TO  6340 FROM  6280.01  6310.01 3838
 6340 DO 6450 MX=1,NCPT                                                    3839
      M= ICPT(MX)                                                          3840
      IF (IRES(M).LE.0) GO TO 6430                                         3841
      EVP(I,M)=EVTMP(M)                                                    3842
      SYEVP(M) = SYEVP(M)+EVP(I,M)                                         3843
      STORA(M) = STORB(I,M)                                                3844
      TMP=1.                                                               3845
      ITP=NFL                                                              3846
      TMPG=STORL(I,M,1)                                                    3847
      TEMP=STORL(I,M,ITP)-TMPG                                             3848
      IF(TEMP.LE.0.) GO TO 6390                                            3849
      TMP=(STORA(M)-TMPG)/TEMP                                             3850
      IF(TMP-.7) 6350,6350,6380                                            3851
 6350 IF(TMP.GT..4) GO TO 6370                                             3852
      IF(TMP.GT..01) GO TO 6360                                            3853
      NSTOR(I,M,10)=NSTOR(I,M,10)+1                                        3854
      GO TO 6410                                                           3855
C                                  BRANCH TO  6360 FROM  6350.01          3856
 6360 IF(TMP.LE..2) NSTOR(I,M,9)=NSTOR(I,M,9)+1                            3857
      IF(TMP.GT..2) NSTOR(I,M,8)=NSTOR(I,M,8)+1                            3858
      GO TO 6410                                                           3859
C                                  BRANCH TO  6370 FROM  6350.00          3860
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 6370 IF(TMP.LE..6) NSTOR(I,M,7)=NSTOR(I,M,7)+1                          3861
      IF(TMP.GT..6) NSTOR(I,M,6)=NSTOR(I,M,6)+1                          3862
      GO TO 6410                                                         3863
C                                  BRANCH TO  6380 FROM  6340.12         3864
 6380 IF(TMP.GT..9) GO TO 6390                                           3865
      IF(TMP.LE..8) NSTOR(I,M,5)=NSTOR(I,M,5)+1                          3866
      IF(TMP.GT..8) NSTOR(I,M,4)=NSTOR(I,M,4)+1                          3867
      GO TO 6410                                                         3868
C                                  BRANCH TO  6390 FROM  6340.10  6380.00 3869
 6390 IF(TMP.GT..99) GO TO 6400                                          3870
      IF(TMP.LE..95) NSTOR(I,M,3)=NSTOR(I,M,3)+1                         3871
      IF(TMP.GT..95) NSTOR(I,M,2)=NSTOR(I,M,2)+1                         3872
      GO TO 6410                                                         3873
C                                  BRANCH TO  6400 FROM  6390.00         3874
 6400 NSTOR(I,M,1)=NSTOR(I,M,1)+1                                        3875
C                                  BRANCH TO  6410 FROM  6350.03  6360.02 3876
C                                      6370.02  6380.03  6390.03         3877
 6410 CNTRL(I,M)=NL                                                      3878
      ATMP=STORA(M)                                                      3879
      DO 6420 L=2,NL                                                     3880
      TEMP=STORL(I,M,L)                                                  3881
      TMP=STORL(I,M,L-1)                                                 3882
      IF(ATMP.GT.TEMP+.1)GO TO 6420                                      3883
      CNTRL(I,M) = L-1                                                   3884
      IF(TEMP.LE.TMP)GO TO 6430                                          3885
      AL = L-1                                                           3886
      CNTRL(I,M)=AL+(ATMP-TMP)/(TEMP-TMP)                                3887
      GO TO 6430                                                         3888
C                                  BRANCH TO  6420 FROM  6410.02  6410.05 3889
 6420 CONTINUE                                                           3890
C                                  BRANCH TO  6430 FROM  6340.02  6410.07 3891
C                                      6410.10                            3892
 6430 SHRTQ(I,M) =QMINA(I,M)-QA(I,M)                                     3893
      IF (SHRTQ(I,M).LT.0.) SHRTQ(I,M)=0.                                3894
      IF(SHRTQ(I,M).GT..01)NSHMN(M)=NSHMN(M)+1                           3895
      IF(SHRTQ(I,M).GT.SHMX(M))SHMX(M)=SHRTQ(I,M)                        3896
      IF(QM2(M).LE.0..AND.QM2(M).GT.(-.5))GO TO 6440                     3897
      SHRT2(I,M)=QMIN2(I,M)-QA(I,M)                                      3898
      IF (SHRT2(I,M).LT.0.) SHRT2(I,M)=0.                                3899
      IF(SHRT2(I,M).GT..01)NSH2(M)=NSH2(M)+1                             3900
      IF(SHRT2(I,M).GT.SHMX2(M))SHMX2(M)=SHRT2(I,M)                      3901
      SYSH2(M)=SYSH2(M)+SHRT2(I,M)*CT                                    3902
C                                  BRANCH TO  6440 FROM  6430.04         3903
 6440 SYQL(M) = SYQL(M)+QL(I,M)*CT                                       3904
      SYPRE(M) = SYPRE(M)+QPREP(I,M)*CT                                  3905
      SYQI(M) = SYQI(M)+QI(I,M)*CT                                       3906
      SYQMN(M) = SYQMN(M)+QMIN2(I,M)*CT                                  3907
      SYQ(M) = SYQ(M)+QMINA(I,M)*CT                                      3908
      SYCNS(M) = SYCNS(M)+QCONS(I,M)*CT                                  3909
      SYQA(M) = SYQA(M)+QA(I,M)*CT                                       3910
      SYSHQ(M) = SYSHQ(M)+SHRTQ(I,M)*CT                                  3911
C                                  BRANCH TO  6450 FROM  6340.00         3912
 6450 CONTINUE                                                           3913
      IF (NDIV.LE.0) GO TO 6470                                          3914
      DO 6460 ID=1,NDIV                                                  3915
      SHDIV(I,ID)=0.                                                     3916
      SYDV(ID)=SYDV(ID)+QDIV(I,ID)*CT                                    3917
      SYDVA(ID)=SYDVA(ID)+QDIVA(I,ID)*CT                                 3918
      IF(RTIOD(ID).LT.0.)GO TO 6460                                      3919
      SHDIV(I,ID) = QDIV(I,ID)-QDIVA(I,ID)                               3920
      IF (SHDIV(I,ID).LT.0.) SHDIV(I,ID)=0.                              3921
      M=IDV(ID)                                                          3922
      IF(IDSHT(M).GT.0) SHDIV(I,ID)=0.                                   3923
      IF(SHDIV(I,ID).GT..01)NDVSH(ID)=NDVSH(ID)+1                        3924
      IF(SHDIV(I,ID).GT.SHDMX(ID))SHDMX(ID)=SHDIV(I,ID)                  3925
      SYSHD(ID) = SYSHD(ID)+SHDIV(I,ID)*CT                               3926
C                                  BRANCH TO  6460 FROM  6450.02  6450.06 3927
 6460 CONTINUE                                                           3928
C                                  BRANCH TO  6470 FROM       .46  6450.01 3929
 6470 CONTINUE                                                           3930
      RETURN                                                             3931
      END                                                                3932
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      SUBROUTINE ECON                                                   3933
C     ECONOMIC EVALUATION OF MULTI-RESERVOIR OPERATION                  3934
      DIMENSION A(15),BEN(12,8),Q(12),SM(12),V(8,40),VLEFT(8,40),       3935
     . VMAX(8,40),VU(8,40)                                              3936
      COMMON/BETA/                                                      3937
     . NYRS,IRG(10),CPT(40,8),ICPT(40),IRES(40),NCPT,NPER,QUNIT,VUNIT   3938
      COMMON/BALT/ IECON,IE(8,40),IYEAR,NRESR(40),ECVAL(12,40,10),      3939
     . QII(12,40),HYVAL(12,40,8),TMPP(40),TMPX(12)                      3940
      COMMON/GAMMA/ IRESM(40,30)                                        3941
C                                BRANCH TO  7000 FROM  7080.03  7510.02 3942
 7000 FORMAT(1H1)                                                       3943
C                                BRANCH TO  7010 FROM  7110.02          3944
 7010 FORMAT(2X,15A4)                                                   3945
C                                BRANCH TO  7020 FROM  7100.00          3946
 7020 FORMAT(I3,2X,8A4)                                                 3947
C                                BRANCH TO  7030 FROM  7130.13  7130.15 3948
C                                    7130.16  7130.18                  3949
 7030 FORMAT(4X,I4,I8,8F8.0)                                            3950
C                                BRANCH TO  7040 FROM  7120.00          3951
 7040 FORMAT(I3,2X15A4)                                                 3952
C                                BRANCH TO  7050 FROM  7550.01  7600.01 3953
C                                    7640.01  7680.01  7720.01         3954
 7050 FORMAT(I3,13F9.0)                                                 3955
C                                BRANCH TO  7060 FROM  7530.02  7580.01 3956
C                                    7620.02  7660.02  7700.02         3957
 7060 FORMAT( 11H STA    SUM 12I9)                                      3958
C                                BRANCH TO  7070 FROM  7560.01  7610.01 3959
C                                    7650.01  7690.01  7730.01         3960
 7070 FORMAT(/3H SM 13F9.0)                                             3961
C                                BRANCH TO  7080 FROM  7400.01          3962
 7080 FORMAT (1H+,I3,14F8.1)                                            3963
C *A*  * * * * JOB AND STATION SPECIFICATION * * * * * * * * * * * * * 3964
      NL=8                                                              3965
      NE=NL                                                             3966
      WRITE ( 6,7000)                                                   3967
      WRITE ( 6,7090)                                                   3968
 7090 FORMAT(37H CONTROL POINTS IDENTIFIED AS FOLLOWS )                 3969
      DO 7100 MX=1,NCPT                                                 3970
      M=ICPT(MX)                                                        3971
C                                BRANCH TO  7100 FROM  7090.01          3972
 7100 WRITE ( 6,7020)M,(CPT(M,K),K=1,8)                                 3973
      WRITE ( 6,7110)                                                   3974
 7110 FORMAT(40H0BENEFIT FUNCTIONS IDENTIFIED AS FOLLOWS)               3975
      DO 7120 J=1,NE                                                    3976
C                                          **CARD BN**                 3977
      READ(2,7010)(A(K),K=1,15)                                         3978
C                                BRANCH TO  7120 FROM  7110.01          3979
 7120 WRITE ( 6,7040)J,(A(K),K=1,15)                                    3980
C  * * * * * * READ ECONOMIC FUNCTIONS * * * * * * * * * * * * * * * * 3981
      NEA=0                                                             3982
      DO 7510 J=1,NE                                                    3983
      IYRA=IYEAR                                                        3984
      REWIND 3                                                          3985
      WRITE ( 6,7130)J                                                  3986
 7130 FORMAT(/22H FUNCTIONS FOR BENEFIT I2)                             3987
      JTMP=0                                                            3988
      DO 7180 MX=1,NCPT                                                 3989
      M=ICPT(MX)                                                        3990
      V(J,M)=0.                                                         3991
      VU(J,M)=0.                                                        3992
      VMAX(J,M)=0.                                                      3993
      VLEFT(J,M)=0.                                                     3994
      IF(IE(J,M).LE.0) GO TO 7180                                       3995
      JTMP=1                                                            3996
      MTH=0                                                             3997
      DO 7170 I=1,NPER                                                  3998
      IF(I.LE.MTH) GO TO 7170                                           3999
C                                          **CARD BP**                 4000
      READ(2,7030) ITMP,MTH,(HYVAL(I,M,L),L=1,NL)                       4001
      IF(M.NE.ITMP) GO TO 7740                                          4002
      WRITE ( 6,7030)ITMP,   MTH,(HYVAL(I,M,L),L=1,NL)                  4003
C                                          **CARD BV**                 4004
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```
      READ(2,7030) ITMP,MTH,(ECVAL(I,M,L),L=1,NL)                          4005
      IF(M.NE.ITMP) GO TO 7740                                             4006
      WRITE ( 6,7030)ITMP,   MTH,(ECVAL(I,M,L),L=1,NL)                     4007
      TMP=0.                                                               4008
      DO 7140 L=1,NL                                                       4009
      IF(ECVAL(I,M,L).GT.TMP)TMP=ECVAL(I,M,L)                              4010
C                                BRANCH TO  7140 FROM  7130.20             4011
 7140 CONTINUE                                                             4012
      VMAX(J,M)=VMAX(J,M)+TMP                                              4013
      IF(MTH.LE.I) GO TO 7170                                              4014
      ITP=I+1                                                              4015
      DO 7160 IX=ITP,MTH                                                   4016
      VMAX(J,M)=VMAX(J,M)+TMP                                              4017
      DO 7150 L=1,NL                                                       4018
      HYVAL(IX,M,L)=HYVAL(I,M,L)                                           4019
C                                BRANCH TO  7150 FROM  7140.06             4020
 7150 ECVAL(IX,M,L)=ECVAL(I,M,L)                                           4021
C                                BRANCH TO  7160 FROM  7140.04             4022
 7160 CONTINUE                                                             4023
C                                BRANCH TO  7170 FROM  7130.11  7130.12    4024
C                                    7140.02                               4025
 7170 CONTINUE                                                             4026
      TEMP=NYRS                                                            4027
      VLEFT(J,M)=VMAX(J,M)*TEMP                                            4028
C                                BRANCH TO  7180 FROM  7130.02  7130.08    4029
 7180 CONTINUE                                                             4030
      IF(JTMP.EQ.1) GO TO 7200                                             4031
      WRITE ( 6,7190)                                                      4032
 7190 FORMAT(5H NONE)                                                      4033
      GO TO 7510                                                           4034
C =B=  * * * * COMPUTE BENEFIT VALUES  * * * * * * * * * * * * * * * * *  4035
C                                BRANCH TO  7200 FROM  7180.01             4036
 7200 DO 7500 IY=1,NYRS                                                    4037
      IF(IECON.LE.1) GO TO 7240                                            4038
      WRITE ( 6,7210)IYRA,J                                                4039
 7210 FORMAT(/39X,32HMONTHLY UNALLOCATED BENEFITS FOR I5,                  4040
     .  10H, FUNCTION  I2)                                                 4041
      WRITE ( 6,7220)(I,I=1,NPER)                                          4042
 7220 FORMAT (4H+STA 14I8)                                                 4043
      WRITE ( 6,7230)                                                      4044
 7230 FORMAT (119X,5HTOTAL)                                                4045
C                                BRANCH TO  7240 FROM  7200.01             4046
 7240 SUMA=0.                                                              4047
      DO 7250 I=1,NPER                                                     4048
 7250 SM(I)=0.                                                             4049
      DO 7470 MX=1,NCPT                                                    4050
      M=ICPT(MX)                                                           4051
      ITMP=NRESR(M)                                                        4052
      IF(ITMP.LE.0) GO TO 7270                                             4053
      DO 7260 K=1,ITMP                                                     4054
 7260 READ (3) (QII(I,K),I=1,NPER)                                         4055
      READ (3) (TMPX(I),I=1,NPER)                                          4056
C                                BRANCH TO  7270 FROM  7250.04             4057
 7270 DO 7460 ITP=1,NE                                                     4058
      IF(IE(ITP,M).LE.0) GO TO 7460                                        4059
C =C=          FIRST PASS THRU ROUTINE                                     4060
      IB=-1                                                                4061
      SUM=0.                                                               4062
      GO TO 7290                                                           4063
C                                BRANCH TO  7280 FROM  7430.01  7450.01    4064
 7280 IB=1                                                                 4065
C                                BRANCH TO  7290 FROM  7270.04             4066
 7290 READ (3) (Q(I),I=1,NPER)                                             4067
      IF(ITP.EQ.J) GO TO 7300                                              4068
      IF(IE(ITP,M).EQ.1)READ (3)(Q(I),I=1,NPER)                            4069
      GO TO 7460                                                           4070
C                                BRANCH TO  7300 FROM  7290.01  7390.01    4071
 7300 DO 7370 I=1,NPER                                                     4072
      DO 7310 L=2,NL                                                       4073
      IF(HYVAL(I,M,L-1).GT.HYVAL(I,M,L))GO TO 7320                         4074
      IF(Q(I)-HYVAL(I,M,L)) 7330,7330,7310                                 4075
C                                BRANCH TO  7310 FROM  7300.01             4076
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 7310 CONTINUE                                                          4077
      L=NL                                                              4078
      GO TO 7330                                                        4079
C                                  BRANCH TO  7320 FROM  7300.02        4080
 7320 L=L-1                                                             4081
C                                  BRANCH TO  7330 FROM  7300.03  7310.02 4082
 7330 TMP=1.                                                            4083
      IF(HYVAL(I,M,L-1).LT.HYVAL(I,M,L))                                4084
     .TMP=(Q(I)-HYVAL(I,M,L-1))/(HYVAL(I,M,L)-HYVAL(I,M,L-1))           4085
      TMPP(I)=ECVAL(I,M,L-1)*(1.-TMP)+ECVAL(I,M,L)*TMP                  4086
C            IB=-1 REG,IB=0 NO RES,IB=1 NO RES OR DIV                   4087
      IF (IB) 7340,7350,7360                                            4088
 7340 V(J,M)=V(J,M)+TMPP(I)                                             4089
      VU(J,M)=VU(J,M)+TMPP(I)                                           4090
      BEN(I,J)=TMPP(I)                                                  4091
      SUM=SUM+TMPP(I)                                                   4092
      SM(I)=SM(I)+TMPP(I)                                               4093
      VLEFT(J,M)=VLEFT(J,M)-TMPP(I)                                     4094
      GO TO 7370                                                        4095
C                                  BRANCH TO  7350 FROM  7330.04        4096
 7350 BEN(I,J)=BEN(I,J)-TMPP(I)                                         4097
      GO TO 7370                                                        4098
C                                  BRANCH TO  7360 FROM  7330.04        4099
 7360 BEN(I,J)=BEN(I,J)-TMPP(I)                                         4100
      SUM=SUM-TMPP(I)                                                   4101
      SM(I)=SM(I)-TMPP(I)                                               4102
      V(J,M)=V(J,M)-TMPP(I)                                             4103
      VU(J,M)=VU(J,M)-TMPP(I)                                           4104
C                                  BRANCH TO  7370 FROM  7300.00  7340.06 4105
C                                      7350.01                         4106
 7370 CONTINUE                                                          4107
      IF (IE(J,M).NE.1) GO TO 7400                                      4108
      IF (IB) 7380,7430,7400                                            4109
 7380 IB=0                                                              4110
      DO 7390 I=1,NPER                                                  4111
      Q(I)=Q(I)-TMPX(I)                                                 4112
C                                  BRANCH TO  7390 FROM  7380.01        4113
 7390 CONTINUE                                                          4114
      GO TO 7300                                                        4115
C                                  BRANCH TO  7400 FROM  7370.01  7370.02 4116
 7400 IF(IECON.LE.1)GO TO 7420                                          4117
      WRITE ( 6,7080) M,(BEN(I,J),I=1,NPER)                             4118
      WRITE ( 6,7410) SUM                                               4119
C                                  BRANCH TO  7410 FROM  7480.01        4120
 7410 FORMAT (116X,F9.1)                                                4121
C                                  BRANCH TO  7420 FROM  7400.00        4122
 7420 SUMA=SUMA+SUM                                                     4123
      GO TO 7460                                                        4124
C                                  BRANCH TO  7430 FROM  7370.02        4125
 7430 ITMP=NRESR(M)                                                     4126
      IF(ITMP.LE.0)GO TO 7280                                           4127
      DO 7450 I=1,NPER                                                  4128
      DO 7440 K=1,ITMP                                                  4129
      IR=IRESM(M,K)                                                     4130
      IF(IR.LT.0)IR=-IR                                                 4131
C                                  BRANCH TO  7440 FROM  7430.03        4132
 7440 V(J,IR)=V(J,IR)+BEN(I,J)*QII(I,K)                                 4133
      V(J,M)=V(J,M)-BEN(I,J)                                            4134
      BEN(I,J)=BEN(I,J)+TMPP(I)                                         4135
C                                  BRANCH TO  7450 FROM  7430.02        4136
 7450 CONTINUE                                                          4137
      GO TO 7280                                                        4138
C                                  BRANCH TO  7460 FROM  7270.00  7270.01 4139
C                                      7290.03  7420.01                4140
 7460 CONTINUE                                                          4141
C                                  BRANCH TO  7470 FROM  7250.01        4142
 7470 CONTINUE                                                          4143
      IF(IECON.LE.1)GO TO 7490                                          4144
      WRITE ( 6,7480)(SM(I),I=1,NPER)                                   4145
 7480 FORMAT (/1H+,3HTOT,14F8.1)                                        4146
      WRITE ( 6,7410) SUMA                                              4147
C                                  BRANCH TO  7490 FROM  7470.01        4148
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```
 7490 IYRA=IYRA+1                                                        4149
C                                BRANCH TO  7500 FROM  7200.00          4150
 7500 CONTINUE                                                           4151
      IF(NEA.LT.J)NEA=J                                                  4152
C                                BRANCH TO  7510 FROM  7120.02  7190.01 4153
 7510 CONTINUE                                                           4154
      NE=NEA                                                             4155
C =D=  * * * * PRINT RESULTS * * * * * * * * * * * * * * * * * * * * * 4156
      WRITE ( 6,7000)                                                    4157
      WRITE ( 6,7520)                                                    4158
 7520 FORMAT(20X43HAVERAGE ANNUAL BENEFITS IN THOUSAND DOLLARS)          4159
      WRITE ( 6,7530)                                                    4160
 7530 FORMAT (/27X,34HPROJECT BENEFITS AT CONTROL POINTS)                4161
      WRITE(6,7580)                                                      4162
      WRITE ( 6,7060)(J,J=1,NE)                                          4163
      DO 7540 J=1,NE                                                     4164
 7540 SM(J)=0.                                                           4165
      SUMA=0.                                                            4166
      TMP=NYRS                                                           4167
      TMP=1./TMP                                                         4168
      DO 7560 MX=1,NCPT                                                  4169
      M=ICPT(MX)                                                         4170
      SUM=0.                                                             4171
      DO 7550 J=1,NE                                                     4172
      IF(IE(J,M).LE.0) GO TO 7550                                        4173
      VU(J,M)=VU(J,M)*TMP                                                4174
      SM(J)=SM(J)+VU(J,M)                                                4175
      SUM=SUM+VU(J,M)                                                    4176
C                                BRANCH TO  7550 FROM  7540.07  7540.08 4177
 7550 CONTINUE                                                           4178
      WRITE ( 6,7050)M,SUM,(VU(J,M),J=1,NE)                              4179
C                                BRANCH TO  7560 FROM  7540.04          4180
 7560 SUMA=SUMA+SUM                                                      4181
      WRITE ( 6,7070)SUMA,(SM(J),J=1,NE)                                 4182
      WRITE ( 6,7570)                                                    4183
 7570 FORMAT (/22X,40HPROJECT BENEFITS ALLOCATED TO RESERVOIRS)          4184
      WRITE(6,7580)                                                      4185
C                                BRANCH TO  7580 FROM  7530.01  7620.01 4186
C                                    7660.01  7700.01                   4187
 7580 FORMAT(38X 8HFUNCTION)                                             4188
      WRITE ( 6,7060)(J,J=1,NE)                                          4189
      DO 7590 J=1,NE                                                     4190
 7590 SM(J)=0.                                                           4191
      SUMA=0.                                                            4192
      DO 7610 MX=1,NCPT                                                  4193
      M=ICPT(MX)                                                         4194
      SUM=0.                                                             4195
      DO 7600 J=1,NE                                                     4196
      V(J,M)=V(J,M)*TMP                                                  4197
      VLEFT(J,M)=VLEFT(J,M)*TMP                                          4198
      SM(J)=SM(J)+V(J,M)                                                 4199
      SUM=SUM+V(J,M)                                                     4200
C                                BRANCH TO  7600 FROM  7590.05          4201
 7600 CONTINUE                                                           4202
      WRITE ( 6,7050)M,SUM,(V(J,M),J=1,NE)                               4203
C                                BRANCH TO  7610 FROM  7590.02          4204
 7610 SUMA=SUMA+SUM                                                      4205
      WRITE ( 6,7070)SUMA,(SM(J),J=1,NE)                                 4206
      WRITE ( 6,7620)                                                    4207
 7620 FORMAT(/17X,50HPROJECT PLUS PREPROJECT BENEFITS AT CONTROL POINTS) 4208
      WRITE ( 6,7580)                                                    4209
      WRITE ( 6,7060) (J,J=1,NE)                                         4210
      DO 7630 J=1,NE                                                     4211
 7630 SM(J)=0.                                                           4212
      SUMA=0.                                                            4213
      DO 7650 MX=1,NCPT                                                  4214
      M=ICPT(MX)                                                         4215
      SUM=0.                                                             4216
      DO 7640 J=1,NE                                                     4217
      V(J,M)=VMAX(J,M)-VLEFT(J,M)                                        4218
      SM(J)=SM(J)+V(J,M)                                                 4219
      SUM=SUM+V(J,M)                                                     4220
```

```
C                                   BRANCH TO  7640 FROM  7630.05          4221
 7640 CONTINUE                                                             4222
      WRITE ( 6,7050)M,SUM,(V(J,M),J=1,NE)                                 4223
C                                   BRANCH TO  7650 FROM  7630.02          4224
 7650 SUMA=SUMA+SUM                                                        4225
      WRITE ( 6,7070)SUMA,(SM(J),J=1,NE)                                   4226
      WRITE ( 6,7660)                                                      4227
 7660 FORMAT (/21X,42HTOTAL POTENTIAL BENEFITS AT CONTROL POINTS)          4228
      WRITE ( 6,7580)                                                      4229
      WRITE ( 6,7060) (J,J=1,NE)                                           4230
      DO 7670 J=1,NE                                                       4231
 7670 SM(J)=0.                                                             4232
      SUMA=0.                                                              4233
      DO 7690 MX=1,NCPT                                                    4234
      M=ICPT(MX)                                                           4235
      SUM=0.                                                               4236
      DO 7680 J=1,NE                                                       4237
      SM(J)=SM(J)+VMAX(J,M)                                                4238
      SUM=SUM+VMAX(J,M)                                                    4239
C                                   BRANCH TO  7680 FROM  7670.05          4240
 7680 CONTINUE                                                             4241
      WRITE ( 6,7050)M,SUM,(VMAX(J,M),J=1,NE)                              4242
C                                   BRANCH TO  7690 FROM  7670.02          4243
 7690 SUMA=SUMA+SUM                                                        4244
      WRITE ( 6,7070)SUMA,(SM(J),J=1,NE)                                   4245
      WRITE ( 6,7700)                                                      4246
 7700 FORMAT (/19X,46HREMAINING POTENTIAL BENEFITS AT CONTROL POINTS)      4247
      WRITE ( 6,7580)                                                      4248
      WRITE ( 6,7060) (J,J=1,NE)                                           4249
      DO 7710 J=1,NE                                                       4250
 7710 SM(J)=0.                                                             4251
      SUMA=0.                                                              4252
      DO 7730 MX=1,NCPT                                                    4253
      M=ICPT(MX)                                                           4254
      SUM=0.                                                               4255
      DO 7720 J=1,NE                                                       4256
      SM(J)=SM(J)+VLEFT(J,M)                                               4257
      SUM=SUM+VLEFT(J,M)                                                   4258
C                                   BRANCH TO  7720 FROM  7710.05          4259
 7720 CONTINUE                                                             4260
      WRITE ( 6,7050)M,SUM,(VLEFT(J,M),J=1,NE)                             4261
C                                   BRANCH TO  7730 FROM  7710.02          4262
 7730 SUMA=SUMA+SUM                                                        4263
      WRITE ( 6,7070)SUMA,(SM(J),J=1,NE)                                   4264
      RETURN                                                               4265
C                                   BRANCH TO  7740 FROM  7130.14  7130.17 4266
 7740 WRITE ( 6,7750)                                                      4267
 7750 FORMAT(13H WRONG STA NO)                                             4268
      RETURN                                                               4269
      END                                                                  4270
```

```
      SUBROUTINE INTPOL(J,NVAL,TEMP,VAR1,VAR2,TMPP)                     4271
      DIMENSION VAR1(20,40),VAR2(20,40)                                 4272
      IF(TEMP.GT.VAR1(1,J)) GO TO 9600                                  4273
      L=1                                                               4274
      L1=2                                                              4275
      GO TO 9630                                                        4276
C                                  BRANCH TO  9600 FROM       .03       4277
 9600 DO 9610 LL=2,NVAL                                                 4278
      L=LL                                                              4279
      IF(TEMP.LT.VAR1(L,J)) GO TO 9620                                  4280
C                                  BRANCH TO  9610 FROM  9600.00        4281
 9610 CONTINUE                                                          4282
C                                  BRANCH TO  9620 FROM  9600.02        4283
 9620 L1=L-1                                                            4284
C                                  BRANCH TO  9630 FROM       .06       4285
 9630 TMPP=VAR2(L,J)-(VAR1(L,J)-TEMP)/(VAR1(L,J)-VAR1(L1,J))*           4286
     .(VAR2(L,J)-VAR2(L1,J))                                            4287
      RETURN                                                            4288
      END                                                               4289
```

```
      SUBROUTINE REARNG                                                 4290
C     SUMMARY OF OUTPUT FROM PROG 723-X6-L2030                          4291
      COMMON/DTADM/                                                     4292
     . KCPT,KPWR,KPWRS,KRES,KUPST,KDIV,KL,KPER,KQIL,KSERV,KUPQI         4293
      COMMON/DTARG/                                                     4294
     . IZERO(3),IONE(3),ITWO(3),JZERO(3),JONE(3),JTWO(3),               4295
     . KZERO(3),KONE(3),KTWO(3),NFMT(3)                                 4296
      COMMON /ALPHA/                                                    4297
     . APERD(12),APRD(12),IDIV(40),IPWR(40),IYR,NPWR,NRES,QM2(40),      4298
     . TITLE(60),IPWKW                                                  4299
      COMMON/BETA/                                                      4300
     . NYRS,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,CPT(40,8),ICPT(40),IRES(40), 4301
     . NCPT,NPER,QUNIT,VUNIT                                            4302
      COMMON/DLTA1/                                                     4303
     . ARRAY(12,40,2),SYQI(40),QI(12,40),STORB(12,30),                  4304
     . ELEV(12,30),SYEVP(30),EVP(12,30),SYPWR(22),POWER(12,22),         4305
     . SYSHP(22),SHRTP(12,22),SYPMX(22),POWRP(12,20),SYQA(40),QA(12,40) 4306
      COMMON/GAMMA/ AVG(40,50)                                          4307
C          I1 -- UNREGULATED FLOWS                                      4308
C          I2 -- RIVER FLOWS                                            4309
C          I3 -- DIVERSION                                              4310
C          I4 -- DIVERSION SHORTAGE                                     4311
C          I5 -- DESIRED-FLOW SHORTAGE                                  4312
C          I6 -- MINIMUM-FLOW SHORTAGE                                  4313
C          I7 -- END-OF-PERIOD STORAGE                                  4314
C          I8 -- CHANGE IN STORAGE AT END OF PERIOD                     4315
C          I9 -- END-OF-PERIOD ELEVATION                                4316
C          I10-- RESERVOIR DATA                                         4317
C                                  BRANCH TO  8000 FROM  8010.01        4318
 8000 FORMAT (1H1)                                                      4319
C                                  BRANCH TO  8010 FROM  8040.00  8070.00 4320
C                                      8100.00  8130.00  8160.00  8190.00 4321
C                                      8220.00  8300.00  8330.00  8360.01 4322
 8010 FORMAT (23X,A2,19A4)                                              4323
      WRITE ( 6,8000)                                                   4324
      ICND=0                                                            4325
      IF (NYRS.LE.50) GO TO 8030                                        4326
      NYRS=50                                                           4327
      WRITE ( 6,8020)                                                   4328
 8020 FORMAT (45H 50 YEAR LIMIT - REARRANGES FIRST 50 YRS ONLY///)      4329
C                                  BRANCH TO  8030 FROM  8010.03        4330
 8030 IF (I1.LE.0) GO TO 8060                                           4331
      CALL BINTP (ICND,KCPT)                                            4332
C                                  BRANCH TO  8040 FROM  8050.04        4333
 8040 WRITE ( 6,8010) TITLE                                             4334
      WRITE ( 6,8050)QUNIT                                              4335
 8050 FORMAT(/47X,22H UNREGULATED FLOWS IN A4)                          4336
      CALL OUTPT (I1,1,IZERO,JZERO,KZERO)                               4337
      IF (I1.LE.2) GO TO 8060                                           4338
      I1=2                                                              4339
      GO TO 8040                                                        4340
C                                  BRANCH TO  8060 FROM  8030.00  8050.02 4341
 8060 IF (I2.LE.0) GO TO 8090                                           4342
      CALL BINTP (ICND,KCPT)                                            4343
C                                  BRANCH TO  8070 FROM  8080.04        4344
 8070 WRITE ( 6,8010) TITLE                                             4345
      WRITE ( 6,8080)QUNIT                                              4346
 8080 FORMAT(/45X,27H RIVER FLOW (REGULATED) IN A4)                     4347
      CALL OUTPT (I2,1,IZERO,JZERO,KZERO)                               4348
      IF (I2.LE.2) GO TO 8090                                           4349
      I2=2                                                              4350
      GO TO 8070                                                        4351
C                                  BRANCH TO  8090 FROM  8060.00  8080.02 4352
 8090 IF (I3.LE.0) GO TO 8120                                           4353
      CALL BINTP (ICND,KDIV)                                            4354
C                                  BRANCH TO  8100 FROM  8110.04        4355
 8100 WRITE ( 6,8010) TITLE                                             4356
      WRITE ( 6,8110)QUNIT                                              4357
 8110 FORMAT(/51X,14H DIVERSION IN A4)                                  4358
      CALL OUTPT (I3,2,IONE,JONE,KONE)                                  4359
      IF (I3.LE.2) GO TO 8120                                           4360
      I3=2                                                              4361
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```
      GO TO 8100                                                        4362
C                                BRANCH TO  8120 FROM  8090.00  8110.02 4363
 8120 IF (I4.LE.0) GO TO 8150                                           4364
      CALL BINTP (ICND,KDIV)                                            4365
C                                BRANCH TO  8130 FROM  8140.04          4366
 8130 WRITE ( 6,8010) TITLE                                             4367
      WRITE ( 6,8140)QUNIT                                              4368
 8140 FORMAT(/47X,23H DIVERSION SHORTAGE IN A4)                         4369
      CALL OUTPT (I4,2,IONE,JONE,KONE)                                  4370
      IF (I4.LE.2) GO TO 8150                                           4371
      I4=2                                                              4372
      GO TO 8130                                                        4373
C                                BRANCH TO  8150 FROM  8120.00  8140.02 4374
 8150 IF (I5.LE.0) GO TO 8180                                           4375
      CALL BINTP (ICND,KCPT)                                            4376
C                                BRANCH TO  8160 FROM  8170.04          4377
 8160 WRITE ( 6,8010) TITLE                                             4378
      WRITE ( 6,8170)QUNIT                                              4379
 8170 FORMAT(/46X,26H DESIRED FLOW SHORTAGE IN A4)                      4380
      CALL OUTPT (I5,1,IZERO,JONE,KZERO)                                4381
      IF (I5.LE.2) GO TO 8180                                           4382
      I5=2                                                              4383
      GO TO 8160                                                        4384
C                                BRANCH TO  8180 FROM  8150.00  8170.02 4385
 8180 IF (I6.LE.0) GO TO 8210                                           4386
      CALL BINTP (ICND,KCPT)                                            4387
C                                BRANCH TO  8190 FROM  8200.04          4388
 8190 WRITE ( 6,8010) TITLE                                             4389
      WRITE ( 6,8200)QUNIT                                              4390
 8200 FORMAT(/46X,26H MINIMUM FLOW SHORTAGE IN A4)                      4391
      CALL OUTPT (I6,3,IZERO,JONE,KZERO)                                4392
      IF (I6.LE.2) GO TO 8210                                           4393
      I6=2                                                              4394
      GO TO 8190                                                        4395
C                                BRANCH TO  8210 FROM  8180.00  8200.02 4396
 8210 IF (NRES.LE.0) RETURN                                             4397
      IF (I7.LE.0) GO TO 8240                                           4398
      CALL BINTP (ICND,KRES)                                            4399
C                                BRANCH TO  8220 FROM  8230.04          4400
 8220 WRITE ( 6,8010) TITLE                                             4401
      WRITE ( 6,8230)VUNIT                                              4402
 8230 FORMAT(/43X,26H END OF PERIOD STORAGE IN A4)                       4403
      CALL OUTPT (I7,5,IZERO,JZERO,KZERO)                               4404
      IF (I7.LE.2) GO TO 8240                                           4405
      I7=2                                                              4406
      GO TO 8220                                                        4407
C                                BRANCH TO  8240 FROM  8210.01  8230.02 4408
 8240 IF (I8.LE.0) GO TO 8320                                           4409
      IF(I7.LE.0) CALL BINTP(ICND,KRES)                                 4410
      DO 8260 J=2,NYRS                                                  4411
      DO 8250 MX=1,NCPT                                                 4412
      M=ICPT(MX)                                                        4413
      IF(IRES(M).LE.0) GO TO 8250                                       4414
      AVG(M,J)=ARRAY(NPER,M,J=1)                                        4415
C                                BRANCH TO  8250 FROM  8240.03  8240.05 4416
 8250 CONTINUE                                                          4417
C                                BRANCH TO  8260 FROM  8240.02          4418
 8260 CONTINUE                                                          4419
      DO 8290 J=1,NYRS                                                  4420
      DO 8280 MX=1,NCPT                                                 4421
      M=ICPT(MX)                                                        4422
      IF (IRES(M).LE.0) GO TO 8280                                      4423
      TMP=AVG(M,J)                                                      4424
      AVG(M,J)=ARRAY(NPER,M,J)=TMP                                      4425
      DO 8270 I=1,NPER                                                  4426
      TEMP=ARRAY(I,M,J)                                                 4427
      ARRAY(I,M,J)=TEMP=TMP                                             4428
      TMP=TEMP                                                          4429
C                                BRANCH TO  8270 FROM  8260.07          4430
 8270 CONTINUE                                                          4431
C                                BRANCH TO  8280 FROM  8260.02  8260.04 4432
 8280 CONTINUE                                                          4433
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C                                   BRANCH TO  8290 FROM  8260.01          4434
 8290 CONTINUE                                                             4435
C                                   BRANCH TO  8300 FROM  8310.04          4436
 8300 WRITE ( 6,8010) TITLE                                                4437
      WRITE ( 6,8310)VUNIT                                                 4438
 8310 FORMAT(/46X,19H STORAGE CHANGE IN A4)                                4439
      CALL OUTPT (I8,4,IZERO,JZERO,NFMT)                                   4440
      IF (I8.LE.2) GO TO 8320                                              4441
      I8=2                                                                 4442
      GO TO 8300                                                           4443
C                                   BRANCH TO  8320 FROM  8240.00  8310.02 4444
 8320 IF (I9.LE.0) GO TO 8360                                              4445
      CALL BINTP (ICND,KRES)                                               4446
C                                   BRANCH TO  8330 FROM  8340.04          4447
 8330 WRITE ( 6,8010) TITLE                                                4448
      WRITE ( 6,8340)                                                      4449
 8340 FORMAT(/45X,32H END OF PERIOD ELEVATION IN FFET)                     4450
      CALL OUTPT (I9,5,ITWO,JTWO,KTWO)                                     4451
      IF (I9.LE.2) GO TO 8360                                              4452
      I9=2                                                                 4453
      GO TO 8330                                                           4454
C                                   BRANCH TO  8350 FROM  8360.02          4455
 8350 FORMAT(/52X,15H RESERVOIR DATA )                                     4456
C                                   BRANCH TO  8360 FROM  8320.00  8340.02 4457
 8360 IF(I10.LE.0) RETURN                                                  4458
      WRITE ( 6,8010)TITLE                                                 4459
      WRITE ( 6,8350)                                                      4460
      DO 8550 MX=1,NCPT                                                    4461
      M=ICPT(MX)                                                           4462
      IF(IRES(M).LE.0) GO TO 8550                                          4463
      IYEAR=IYR                                                            4464
      GO TO (8380,8370),I10                                                4465
 8370 IF(IPWR(M).LE.0) GO TO 8550                                          4466
C                                   BRANCH TO  8380 FROM  8360.07          4467
 8380 REWIND 1                                                             4468
      WRITE ( 6,8390) M,(CPT(M,I),I=1,8)                                   4469
 8390 FORMAT(/1X,46(1H+)/8H + CP NO I4,1X,8A4,2H +/1X,46(1H+))             4470
      IF(IPWKW.LE.0) GO TO 8410                                            4471
      WRITE ( 6,8400)                                                      4472
 8400 FORMAT(/13X,77H MONTH     STORAGE      ELEV      INFLOW    OUTFLOW   4473
     . EVAP     AVG GEN     GEN PK/23X,68H AC-FT        FT          CFS    4474
     ,CFS       AC-FT     MEGAWATT  KILOWATT )                            4475
      GO TO 8430                                                           4476
C                                   BRANCH TO  8410 FROM  8390.01          4477
 8410 WRITE ( 6,8420)                                                      4478
 8420 FORMAT(/13X,77H MONTH     STORAGE      ELEV      INFLOW    OUTFLOW   4479
     . EVAP     GEN PWR           /23X,68H AC-FT        FT          CFS    4480
     ,CFS       AC-FT     1000 KWH          )                             4481
C                                   BRANCH TO  8430 FROM  8400.03          4482
 8430 DO 8540 J=1,NYRS                                                     4483
      READ(1)SYQI,QI,STORB,ELEV,SYEVP,EVP,SYPWR,POWER,SYSHP,SHRTP,SYPMX,   4484
     .       POWRP,SYQA,QA                                                 4485
      WRITE ( 6,8440)IYEAR                                                 4486
 8440 FORMAT(/3H YR,I5)                                                    4487
      IF(IPWR(M).LE.0) GO TO 8510                                          4488
      K=IPWR(M)                                                            4489
      IF(IPWKW.LE.0) GO TO 8480                                            4490
      SYPWR(K)=SYPWR(K)*.1141                                              4491
      SYSHP(K)=SYSHP(K)*.1141                                              4492
      DO 8450 I=1,NPER                                                     4493
      POWER(I,K)=POWER(I,K)*0.001                                          4494
C                                   BRANCH TO  8450 FROM  8440.06          4495
 8450 CONTINUE                                                             4496
      SYPWR(K)=SYPWR(K)*0.001                                              4497
      WRITE ( 6,8460) (APERD(I),APRD(I),STORB(I,M),ELEV(I,M),QI(I,M),      4498
     .  QA(I,M),EVP(I,M),POWER(I,K),POWRP(I,K),I=1,NPER)                   4499
C                                   BRANCH TO  8460 FROM  8450.02          4500
 8460 FORMAT(10X,2A4,F12.0,F10.2,F10.0,F9.0,F8.0,F12.2,F10.0)              4501
      WRITE ( 6,8470) SYQI(M),SYQA(M),SYEVP(M),SYPWR(K),SYPMX(K)           4502
 8470 FORMAT(13X,5H YEAR 22X,F10.0,F9.0,F8.0,F12.2,F10.0)                  4503
      GO TO 8530                                                           4504
C                                   BRANCH TO  8480 FROM  8440.03          4505
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 8480 WRITE ( 6,8490) (APERD(I),APRD(I),STORB(I,M),ELEV(I,M),QI(I,M),     4506
     .  QA(I,M),EVP(I,M),POWER(I,K),I=1,NPER)                            4507
C                                BRANCH TO  8490 FROM  8480.00  8510.01 4508
 8490 FORMAT(10X,2A4,F12.0,F10.2,F10.0,F9.0,F8.0,F12.0)                  4509
      WRITE ( 6,8500) SYQI(M),SYQA(M),SYEVP(M),SYPWR(K)                  4510
C                                BRANCH TO  8500 FROM  8520.01          4511
 8500 FORMAT(13X,5H YEAR 22X,F10.0,F9.0,F8.0,F12.0)                      4512
      GO TO 8530                                                         4513
C                                BRANCH TO  8510 FROM  8440.01          4514
 8510 DO 8520 I=1,NPER                                                   4515
      WRITE ( 6,8490)  APERD(I),APRD(I),STORB(I,M),ELEV(I,M),QI(I,M),    4516
     .  QA(I,M),EVP(I,M)                                                 4517
C                                BRANCH TO  8520 FROM  8510.00          4518
 8520 CONTINUE                                                           4519
      WRITE ( 6,8500) SYQI(M),SYQA(M),SYEVP(M)                           4520
C                                BRANCH TO  8530 FROM  8470.01  8500.01 4521
 8530 IYEAR=IYEAR+1                                                      4522
C                                BRANCH TO  8540 FROM  8430.00          4523
 8540 CONTINUE                                                           4524
C                                BRANCH TO  8550 FROM  8360.03  8360.05 4525
C                                    8370.00                            4526
 8550 CONTINUE                                                           4527
      RETURN                                                             4528
      END                                                                4529
```

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      SUBROUTINE BINTP(ICND,LMT)                                                4530
      DIMENSION IND(9)                                                          4531
      COMMON/BETA/                                                              4532
     . NYRS,IRG(10),CPT(40,8),ICPT(40),IRES(40),NCPT,NPER                       4533
      COMMON/DLTA1/ ARRAY(12,40,2)                                              4534
      COMMON/GAMMA/ AVG(40,50)                                                  4535
      IF(ICND.EQ.1)GO TO 9030                                                   4536
      DO 9000 I=1,9                                                             4537
 9000 IND(I)=0                                                                  4538
      ID=0                                                                      4539
      DO 9010 I=1,6                                                             4540
      IF(IRG(I).LE.0)GO TO 9010                                                 4541
      ID=ID+1                                                                   4542
      IND(I)=ID                                                                 4543
C                                  BRANCH TO  9010 FROM  9000.02  9000.03 4544
 9010 CONTINUE                                                                  4545
      IF(IRG(7).LE.0.AND.IRG(8).LE.0) GO TO 9020                                4546
      ID=ID+1                                                                   4547
      IND(7)=ID                                                                 4548
C                                  BRANCH TO  9020 FROM  9010.01          4549
 9020 IF(IRG(9).LE.0)GO TO 9030                                                 4550
      ID=ID+1                                                                   4551
      IND(9)=ID                                                                 4552
C                                  BRANCH TO  9030 FROM        .07  9020.00 4553
 9030 DO 9040 I=1,6                                                             4554
      IF(IRG(I).GT.0.AND.IND(I).GT.0)GO TO 9060                                 4555
C                                  BRANCH TO  9040 FROM  9030.00          4556
 9040 CONTINUE                                                                  4557
      IF((IRG(7).LE.0.AND.IRG(8).LE.0).OR.IND(7).LE.0)GO TO 9050                4558
      I=7                                                                       4559
      GO TO 9060                                                                4560
C                                  BRANCH TO  9050 FROM  9040.01          4561
 9050 IF(IRG(9).LE.0.OR.IND(9).LE.0)RETURN                                      4562
      I=9                                                                       4563
C                                  BRANCH TO  9060 FROM  9030.01  9040.03 4564
 9060 IDN=0                                                                     4565
      IDNN=ID-IND(I)                                                            4566
      IF(ICND.EQ.0) GO TO 9080                                                  4567
      DO 9070 J=1,I                                                             4568
      IF(IRG(J).GT.0.AND.IND(J).EQ.0)IDN=IDN+1                                  4569
C                                  BRANCH TO  9070 FROM  9060.03          4570
 9070 CONTINUE                                                                  4571
      IF(I.EQ.9.AND.IRG(7).GT.0.AND.IRG(8).GT.0)IDN=IDN-1                       4572
C                                  BRANCH TO  9080 FROM  9060.02          4573
 9080 IND(I)=0                                                                  4574
      RE=IND 4                                                                  4575
      DO 9140 J=1,NYRS                                                          4576
      IF(ICND.EQ.0) GO TO 9100                                                  4577
      DO 9090 K=1,IDN                                                           4578
 9090 READ(4)                                                                   4579
C                                  BRANCH TO  9100 FROM  9080.03          4580
 9100 IF(I.EQ.9)GO TO 9110                                                      4581
      READ(4)(AVG(M,J),M=1,LMT),((ARRAY(K,M,J),K=1,NPER),M=1,LMT)               4582
      GO TO 9120                                                                4583
C                                  BRANCH TO  9110 FROM  9100.00          4584
 9110 READ(4)((ARRAY(K,M,J),K=1,NPER),M=1,LMT)                                  4585
C                                  BRANCH TO  9120 FROM  9100.02          4586
 9120 IF(IDNN.EQ.0)GO TO 9140                                                   4587
      DO 9130 K=1,IDNN                                                          4588
      READ(4)                                                                   4589
C                                  BRANCH TO  9130 FROM  9120.01          4590
 9130 CONTINUE                                                                  4591
C                                  BRANCH TO  9140 FROM  9080.02  9120.00 4592
 9140 CONTINUE                                                                  4593
      ICND=1                                                                    4594
      RETURN                                                                    4595
      END                                                                       4596
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      SUBROUTINE OUTPT (IND,ITST,IFMT,JFMT,KFMT)                        4597
      DIMENSION AVE(12),IFMT(3),JFMT(3),KFMT(4)                         4598
      COMMON /ALPHA/                                                    4599
     . APERD(12),APRD(12),IDIV(40),IPWR(40),IYR,NPWR,NRES,QM2(40),      4600
     . TITLE(60),IPWKW                                                  4601
      COMMON/BETA/                                                      4602
     . NYRS,IRG(10),CPT(40,8),ICPT(40),IRES(40),NCPT,NPER               4603
      COMMON/DLTA1/ ARRAY(12,40,2)                                      4604
      COMMON/GAMMA/ AVG(40,50)                                          4605
C                                BRANCH TO  9200 FROM  9430.01  9520.01 4606
 9200 FORMAT (1H1)                                                      4607
C       ********************************************************       4608
C       * THE CARRIAGE CONTROL '+' (TO PRINT MORE THAN ONE RECORD     *  4609
C       * TO A LINE) DIFFER ON SOME SYSTEMS.  FOR SYSTEMS THAT        *  4610
C       * SUPPRESSES THE SPACE AFTER PRINTING(OPPOSED TO BEFORE       *  4611
C       * PRINTING) ADD TO THE FORMAT STATEMENT A CARRIAGE CONTROL    *  4612
C       * CHARACTER '+' TO CARDS WITH AN 'A' IN COLUMN 73.  DELETE    *  4613
C       * SAME FROM CARD WITH 'D'. ACTIVATE STATEMENTS THAT HAVE AN   *  4614
C       * 'I' IN COLUMN 73 (SUBROUTINE OUTPT).  VICE VERSA FOR SYSTEMS*  4615
C       * THAT SUPPRESSES SPACE BEFORE PRINTING                       *  4616
C       ********************************************************       4617
C                                BRANCH TO  9210 FROM  9310.01          4618
C  9164A                                  )4A82, RAEY   H8/(TAMROF 0129
 9210 FORMAT(/8H+  YEAR ,28A4)                                          A4620
C                                BRANCH TO  9220 FROM  9310.05  9440.04 4621
C  2264D                                   )GVA H4,X321,+H1(TAMROF 0229
 9220 FORMAT(1H ,123X,4H AVG)                                           D4623
C                                BRANCH TO  9230 FROM  9310.00          4624
 9230 FORMAT(/1X,46(1H+)/8H + CP NO I4,1X,8A4,2H +/1X,46(1H+))          4625
C                                BRANCH TO  9240 FROM  9440.02          4626
 9240 FORMAT (/5H YEAR,I5)                                              4627
C                                BRANCH TO  9250 FROM  9440.03          4628
C  9264A                                  )4A82,ON PC   H8/(TAMROF 0529
 9250 FORMAT(/8H+  CP NO,28A4)                                          A4630
C                                BRANCH TO  9260 FROM  9340.00          4631
C  2364D                                 )LATOT H6,X121,+H1(TAMROF 0629
 9260 FORMAT(1H ,121X,6H TOTAL)                                         D4633
C                                                                       4634
      ANYRS=NYRS                                                        4635
      GO TO (9270,9440,9270),IND                                        4636
 9270 DO 9430 MX=1,NCPT                                                 4637
      M=ICPT(MX)                                                        4638
      GO TO (9310,9280,9300,9290,9290),ITST                             4639
 9280 IF(IDIV(M)) 9310,9430,9310                                        4640
C                                BRANCH TO  9290 FROM  9270.02          4641
 9290 IF (IRES(M)) 9430,9430,9310                                       4642
C                                BRANCH TO  9300 FROM  9270.02          4643
 9300 IF (QM2(M).LE.0..AND.QM2(M).GT.(-.1)) GO TO 9430                  4644
C                                BRANCH TO  9310 FROM  9270.02  9280.00 4645
C                                   9290.00                             4646
 9310 WRITE ( 6,9230) M,(CPT(M,K),K=1,8)                                4647
      WRITE ( 6,9210) (APERD(I),APRD(I),I=1,NPER)                       4648
      IF (ITST.EQ.4) GO TO 9340                                         4649
      IF(ITST.EQ.5)GO TO 9320                                           4650
      IF(ITST.EQ.2)M=IABS(IDIV(M))                                      4651
      WRITE ( 6,9220)                                                   4652
      GO TO 9350                                                        4653
C                                BRANCH TO  9320 FROM  9310.03          4654
 9320    CONTINUE                                                       4655
      WRITE(6,9330)                                                     I4656
C                                BRANCH TO  9330 FROM  9380.00  9420.00 4657
C                                   9440.05  9500.00                    4658
 9330 FORMAT(1H )                                                       I4659
      GO TO 9350                                                        4660
C                                BRANCH TO  9340 FROM  9310.02          4661
 9340 WRITE ( 6,9260)                                                   4662
C                                BRANCH TO  9350 FROM  9310.06  9330.01 4663
 9350 DO 9360 I=1,NPER                                                  4664
 9360 AVE(I)=0.                                                         4665
      TAVE = 0                                                          4666
      IYEAR = IYR                                                       4667
      DO 9390 J=1,NYRS                                                  4668
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      WRITE(6,IFMT)IYEAR,(ARRAY(I,M,J),I=1,NPER)                          4669
      IYEAR=IYEAR+1                                                       4670
      DO 9370 I=1,NPER                                                    4671
 9370 AVE(I)=AVE(I)+ARRAY(I,M,J)                                          4672
      IF(ITST.EQ.5)GO TO 9380                                             4673
      WRITE(6,JFMT)AVG(M,J)                                               4674
      TAVE = TAVE+AVG(M,J)                                                4675
      GO TO 9390                                                          4676
C                                  BRANCH TO  9380 FROM  9370.01          4677
 9380    CONTINUE                                                         4678
      WRITE(6,9330)                                                      I4679
C                                  BRANCH TO  9390 FROM  9360.03  9370.04 4680
 9390 CONTINUE                                                            4681
      IF (ITST.EQ.4) GO TO 9410                                           4682
      DO 9400 I=1,NPER                                                    4683
 9400 AVE(I)=AVE(I)/ANYRS                                                 4684
C                                  BRANCH TO  9410 FROM  9390.01          4685
 9410 WRITE(6,KFMT)(AVE(I),I=1,NPER)                                      4686
      TAVE = TAVE/ANYRS                                                   4687
      IF(ITST.EQ.5) GO TO 9420                                            4688
      WRITE(6,JFMT) TAVE                                                  4689
      GO TO 9430                                                          4690
C                                  BRANCH TO  9420 FROM  9410.02          4691
 9420    CONTINUE                                                         4692
      WRITE(6,9330)                                                      I4693
C                                  BRANCH TO  9430 FROM  9270.00  9280.00 4694
C                                      9290.00  9300.00  9410.04          4695
 9430 CONTINUE                                                            4696
      WRITE ( 6,9200)                                                     4697
      RETURN                                                              4698
C                                  BRANCH TO  9440 FROM  9260.02          4699
 9440 IYEAR=IYR                                                           4700
      DO 9520 J=1,NYRS                                                    4701
      WRITE ( 6,9240) IYEAR                                               4702
      WRITE ( 6,9250) (APERD(I),APRD(I),I=1,NPER)                         4703
      IF(ITST.NE.5)WRITE(6,9220)                                          4704
      IF(ITST.EQ.5)WRITE(6,9330)                                         I4705
      DO 9510 MX=1,NCPT                                                   4706
      M=ICPT(MX)                                                          4707
      GO TO (9480,9450,9470,9460,9460),ITST                               4708
 9450 IF(IDIV(M)) 9490,9510,9490                                          4709
C                                  BRANCH TO  9460 FROM  9440.08          4710
 9460 IF (IRES(M)) 9510,9510,9480                                         4711
C                                  BRANCH TO  9470 FROM  9440.08          4712
 9470 IF (QM2(M).LE.0..AND.QM2(M).GT.(-1.)) GO TO 9510                    4713
C                                  BRANCH TO  9480 FROM  9440.08  9460.00 4714
 9480 WRITE(6,IFMT)M,(ARRAY(I,M,J),I=1,NPER)                              4715
      IF(ITST.EQ.5)GO TO 9500                                             4716
      WRITE(6,JFMT)AVG(M,J)                                               4717
      GO TO 9510                                                          4718
C                                  BRANCH TO  9490 FROM  9450.00          4719
 9490 M=IABS(IDIV(M))                                                     4720
      WRITE(6,IFMT)ICPT(MX),(ARRAY(I,M,J),I=1,NPER)                       4721
      WRITE(6,JFMT)AVG(M,J)                                               4722
      GO TO 9510                                                          4723
C                                  BRANCH TO  9500 FROM  9480.01          4724
 9500    CONTINUE                                                         4725
      WRITE(6,9330)                                                      I4726
C                                  BRANCH TO  9510 FROM  9440.06  9450.00 4727
C                                      9460.00  9470.00  9480.03  9490.03 4728
 9510 CONTINUE                                                            4729
      IYEAR=IYEAR+1                                                       4730
C                                  BRANCH TO  9520 FROM  9440.01          4731
 9520 CONTINUE                                                            4732
      WRITE(6,9200)                                                       4733
      RETURN                                                              4734
      END                                                                 4735
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GPO 789—107/060